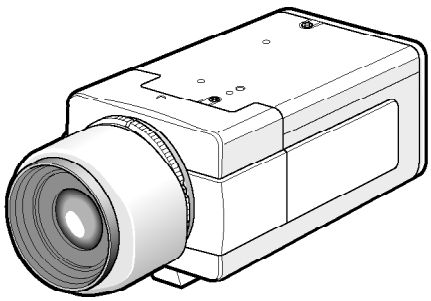
ORDER NO. AVS0005261C8

Service Manual

Colour CCTV Cameras

WV-CP460/WV-CP464



(Lens: Option)

SPECIFICATIONS

Pick-up Device:	753 (H) x 582 (V) pixels, Interline Transfer CCD
Scanning Area:	4.8 (H) x 3.6 (V) mm (Equivalent to scanning area of 1/3" pick-up tube)
Scanning:	625 lines/50 fields/25 frames
Horizontal:	15.625 kHz
Vertical:	50 Hz
Synchronization:	Internal, Line-locked, External (VS/VBS) or Multiplexed Vertical Drive (VD2) selectable
Video Output:	1.0 V[p-p] PAL composite 75 Ω/BNC connector
Horizontal Resolution:	480 lines
Signal-to-Noise Ratio:	50 dB (AGC OFF, weight ON)
Dynamic Range:	48 dB
Minimum Illumination:	0.4 lx (0.04 footcandle) at F0.75 [Equivalent to 0.8 lx (0.08 footcandle) at F1.4]
Gain Control:	AGC ON or OFF (SET UP MENU) selectable
White Balance:	ATW or AWC (SET UP MENU) selectable
Aperture:	Set Variable (SET UP MENU)
Electronic Light Control:	Equivalent to continuous variable shutter speeds between 1/50 s and 1/10 000 s
Super Dynamic Ⅱ:	ON or OFF (SET UP MENU) selectable
Electronic Shutter Speed:	1/50 (OFF), 1/120, 1/250, 1/500, 1/1 000,1/2 000, 1/4 000, 1/10 000 s selectable
Lens Mount:	C mount or CS mount selectable
ALC Lens:	DC or Video selectable
Ambient Operating Temperature:	–10°C - +50°C (14°F - 122°F)
Ambient Operating Humidity:	Less than 90 %
Power Source and Power Consumption:	WV-CP460: 220-240 V AC 50 Hz, 5.1 W WV-CP464: 24 V AC 50 Hz, 4.8 W 12 V DC, 480 mA
Dimensions (without lens):	74 (W) x 55 (H) x 123 (D) mm [2-15/16" (W) x 2-3/16" (H) x 4-13/16" (D)]
Weights (without lens):	WV-CP460: 0.41 kg (0.9 lbs.) (without power cord) WV-CP464: 0.4 kg (0.9 lbs.)

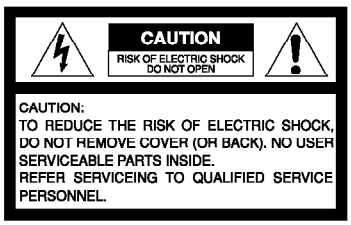
Weights and dimensions indicated are approximate.
Specifications are subject to change without notice.

Panasonic

©2000 Matsushita Communication Industrial Co., Ltd. All rights reserved. Unauthorized copying and distribution is a violation of law.

⚠ WARNING

This service information is designed for experienced repair technicians only and is not designed for use by the general public.
It does not contain warnings or cautions to advise non-technical individuals of potential dangers in attempting to service a product.
Products powered by electricity should be serviced or repaired only by experienced professional technicians. Any attempt to service or repair the product or products dealt with in this service information by anyone else could result in serious injury or death.



This symbol warns the user that uninsuland voltage within the unit may have suificient magnitude to cause electric shock. Therefore, it is dangerous to make any kind of contact with any inside part of this unit.

This symbol alerts the user that impotant literature concerning the operation and maintenance of this has been included. Therefore, it should be read carefully in order to avoid any problems.

IMPORTANT SAFETY NOTICE

There are special components used in this equipment which are important for safety. These parts are indicated by the "⚠" mark on the schematic diagram and the replacement parts list. It is essential that these critical parts should be repleced with manufacture's specified parts to prevent x-radiation, shock, fire, or other hazards. Do not modify the original design without permission of manufacture.

STANDARD ACCESSORIES

Body Cap.....1 pc.
ALC Lens Connector (YFE4191J100).....1 pc.
AC Power Cord (only WV-CP460).....1 pc.

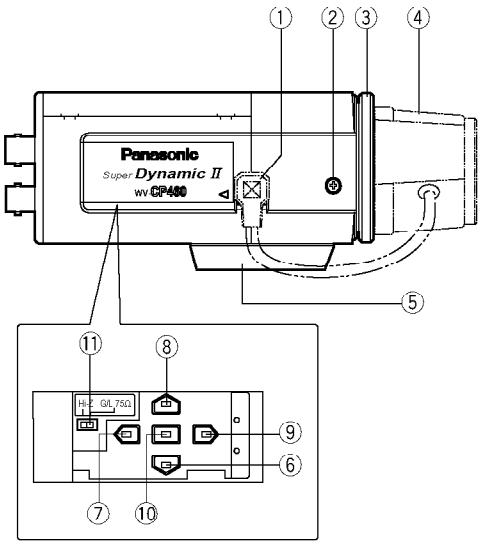
OPTIONAL ACCESSORIES

Lenses : WV-LA2R8C3B, WV-LA4R5C3B, WV-LA9C3B, WV-LA210C3, WV-LA408C3 WV-LA908C3, WV-LZ61/10, WV-LZ61/15, WV-LZ62/2, WV-LZ62/8, WV-LF4R5C3A, WV-LF9C3A

CONTENTS

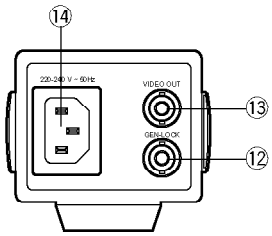
MAJOR OPERATING CONTROLS AND THEIR FUNCTIONS 1
ADJUSTMENT PROCEDURE 2
LOCATION OF TEST POINTS AND ADJUSTING CONTROLS 11
WIRING DIAGRAM 12
SCHEMATIC DIAGRAM
SENSOR BOARD 13
MAIN BOARD 15
I/F BOARD 16
CONDUCTOR VIEW
SENSOR BOARD 13
MAIN BOARD 14
I/F BOARD 16
EXPLODED VIEW
WV-CP460 17
WV-CP464 18
REPLACEMENT PARTS LIST 19

MAJOR OPERATING CONTROLS AND THEIR FUNCTIONS

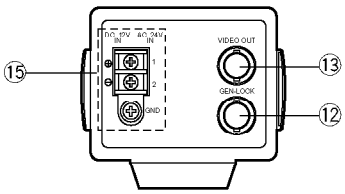


Slide the panel to the left until it locks.

<WV-CP460>



<WV-CP464>



① **Auto Iris Lens Connector**
This connector is used to connect the auto iris lens with a 4-pin male connector supplied as a standard accessory (Part No. YFE4191J100).

② **Focus-Fixing Screw**

③ **Flange-back Adjusting Ring**
This ring is used to adjust the back focal length or picture focus. Rotate this ring clockwise for a C-mount lens or counterclockwise for a CS-mount lens.

④ **Lens (Option)**

⑤ **Camera Mounting Screw Hole**
This hole is used to mount the camera onto a mounting bracket.

⑥ **Down Button ( )**
This button is used to move the cursor downward. It is also used to select items in the CAM SET UP menu.

⑦ **Left Button ( )**
This button is used to move the cursor to the left. It also selects the mode and can be used to adjust some levels.

⑧ **Up Button ( )**
This button is used to move the cursor upward. It is also used to select items in the CAM SET UP menu.

⑨ **Right Button ( )**
This button is used to move the cursor to the right. It also selects the mode and can be used to adjust some levels.

⑩ **Set Button ( )**
This button is used to activate an item selected in the CAM SET UP menu.

⑪ **Gen-lock Termination Switch (Hi-Z, G/L 75 Ω)**
Set this switch to Hi-Z when a gen-lock video input signal is looped through. In all other cases, set this switch to 75 Ω.

⑫ **Gen-lock Input Connector (GEN-LOCK)**
This connector is used to connect an external system for synchronization.

⑬ **Video Output Connector (VIDEO OUT)**
This connector is used to connect the VIDEO IN connector of the monitor.

⑭ **AC Inlet Socket**
This socket is used to connect the power cord (supplied as a standard accessory).

⑮ **AC/DC Compatible Input Terminal (DC 12 V IN/AC 24 V IN)**
This terminal is for connecting the 12 V DC or 24 V AC power supply cord.

Caution:
- Connect to 12 V DC (10.8 V-16 V) or 24 V AC (19.5 V-28 V) class 2 power supply only. Make sure to connect the grounding lead to the GND terminal when the power is supplied from a 24 V AC power source.

ADJUSTMENT PROCEDURE

1. Test Equipment Required

The following test equipment are required for adjustment of the Colour CCTV Camera WV-CP460 and WV-CP464.

- Oscilloscope
- Frequency Counter
- Waveform Monitor
- Vectorscope
- Underscanned Colour Video Monitor
- Video Signal Generator
- 12 V DC Power Supply Unit
- Personal Computer (IBM PC/AT type or equivalent)
- Standard Straight RS-232C Cable
- ALC Lens (WV-LA9C3A, WV-LA9C3B or equivalent)
- Lux Meter
- Lighting (275 footcandles (2,750 ± 150 lux), Colour Temperature 5,100 ± 100 K)
- Colour Temperature Conversion Filters (KENKO: W12, C4 or equivalent)
- Radiation Chart
- Logarithmic Gray Scale Chart. (Part Number:YWV2310RB99)
- Extension Cable as shown in Fig. 1-1. (Part Number: YWV0EA1171AN)

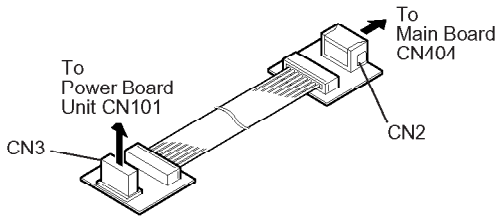


Fig. 1-1

- Remote Electric Variable Resistor (E. V. R.) kit as shown in Fig. 1-2. (Part Number: YWV0EA1174AN)

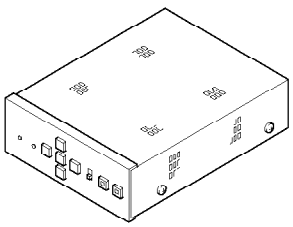


Fig. 1-2

- Make a conversion cable as follows.

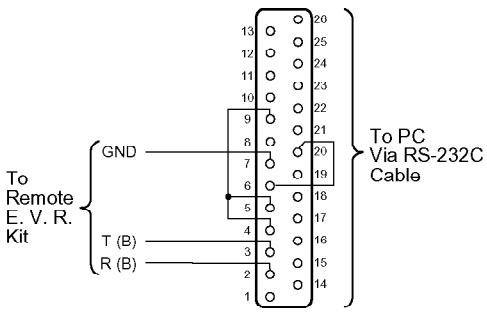


Fig. 1-3

2. Disassembling Procedure for Adjustment

- Referring to Fig. 2-1, remove two screws that secure the Mount Adaptor and remove the Mount Adaptor.

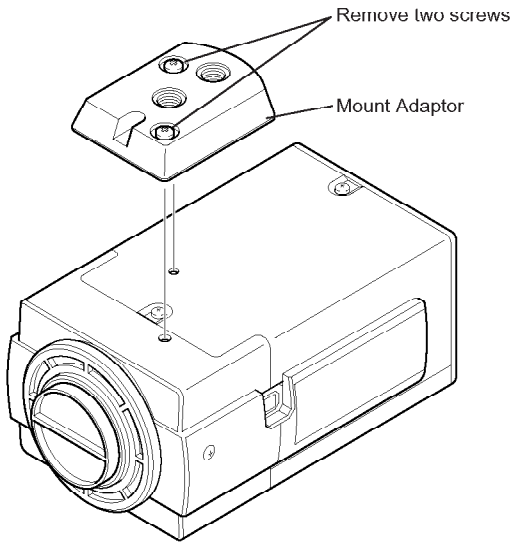


Fig. 2-1

- Referring to Fig. 2-2, remove two screws that secure the Main Cover and remove the Main Cover.

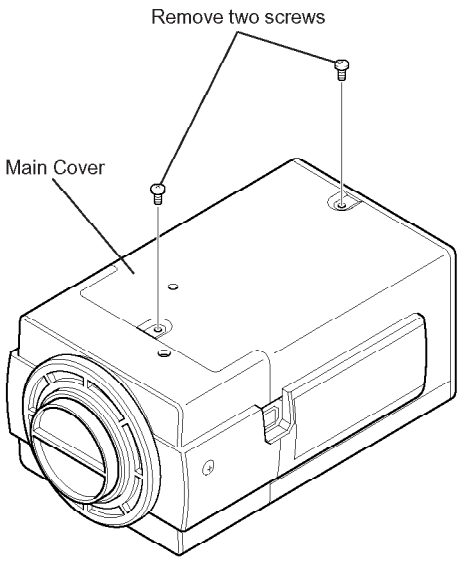


Fig. 2-2

- Referring to Fig. 2-3, remove the Rear Escutcheon and the Rear Panel while Releasing the four hocks of the Rear Escutcheon.

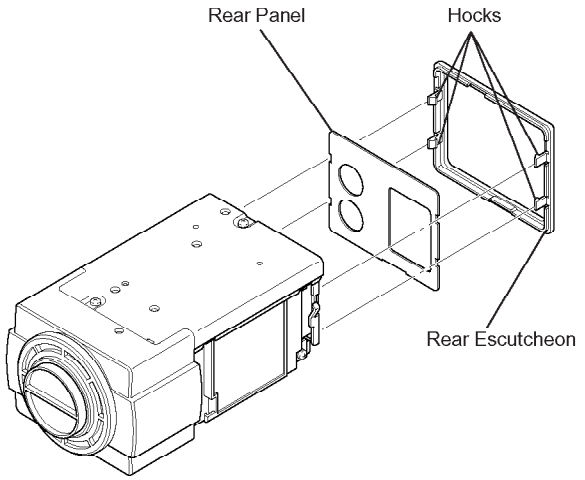


Fig. 2-3

- Referring to Fig. 2-4, remove one screw that secure the Front Unit.
- Disconnect the Connector CN401 on the Main Board and remove the Flexible Board Ass'y and Front Unit for the Head Optical Ass'y Replacement.

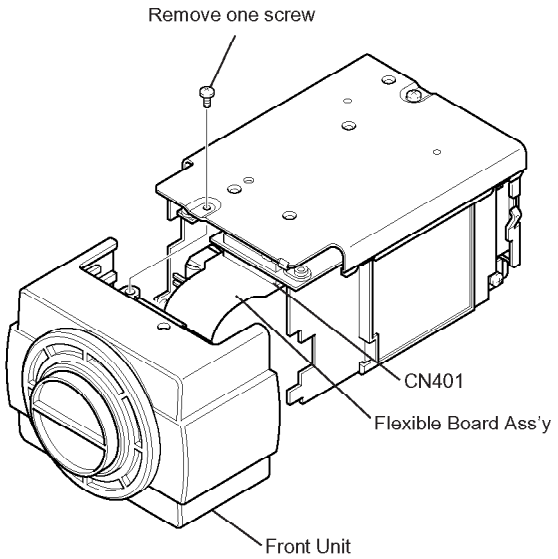


Fig. 2-4

- Referring to Fig. 2-5, remove one screw that secure the I/F Board and Power Board Unit.
- Disconnect the connector CN402 on the Main Board and remove the I/F Board.
- Disconnect the connector CN404 on the Main Board and remove the Power Board Unit.
- Remove one screw that secure the Earth Lug and Washer and remove the Earth Lug and Washer (For WV-CP460 only).

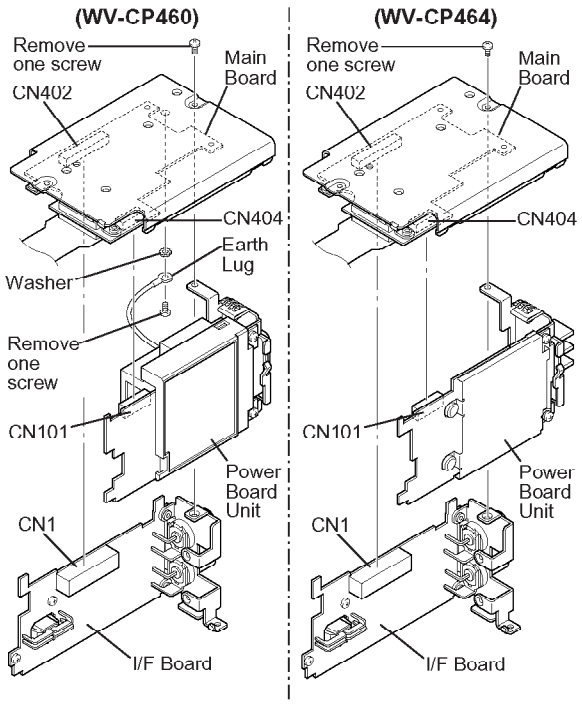


Fig. 2-5

- Referring to Fig. 2-6, remove four screws that secure the Main Board and remove the Main Board from the Main Chassis.

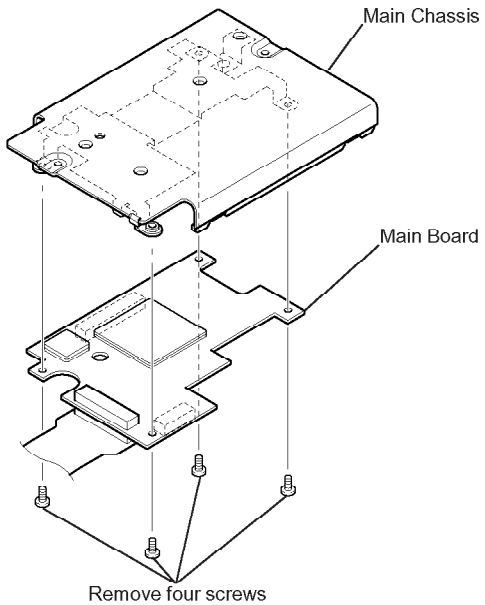


Fig. 2-6

- Reconnect the CN1 on the I/F Board to the CN402 on the Main Board.
- Reconnect the connectors by using the Extension Cable (Refer to Fig. 1-1), between CN404 on the Main Board and CN101 on the Power Board Unit for Adjustment.

3. Head Optical Ass'y Replacement Procedure

- Disassemble the Front Unit of the Camera while referring to the item **2. Disassembling Procedure for Adjustment**.
- Referring to Fig. 3-1, Disconnect the Connector on the Head Optical Ass'y and remove the Flexible Board Ass'y.
- Remove two screws that secure the Head Optical Ass'y on the Front Unit and remove the Head Optical Ass'y on the Front Unit.
- Replace Head Optical Ass'y with new one.

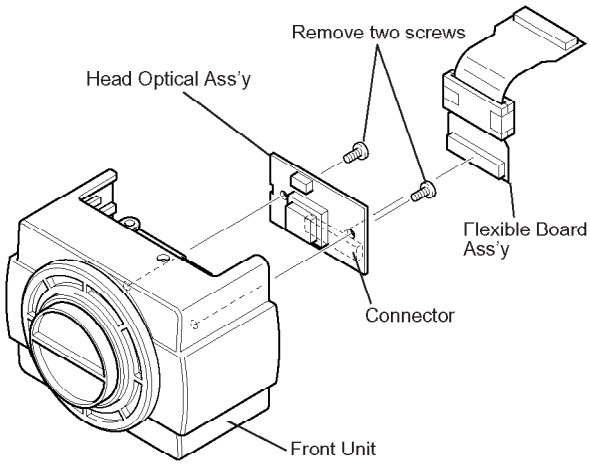


Fig. 3-1

4. Connection and Setting Up for Adjustment

4.1. Connection

- The Fig. 4-1 shows the connecting diagram for the adjustment procedure.

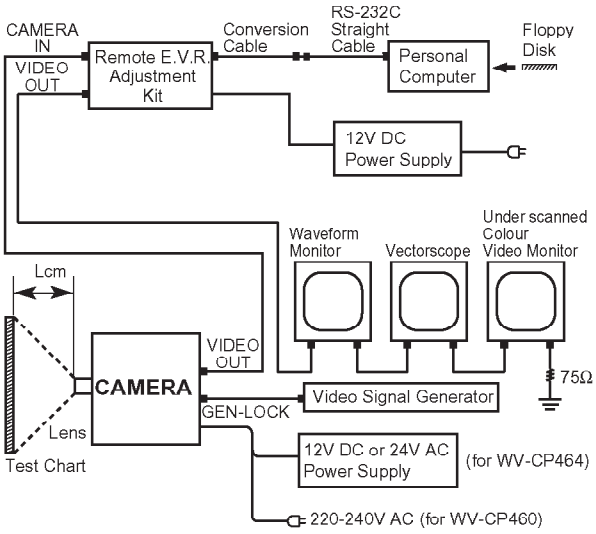
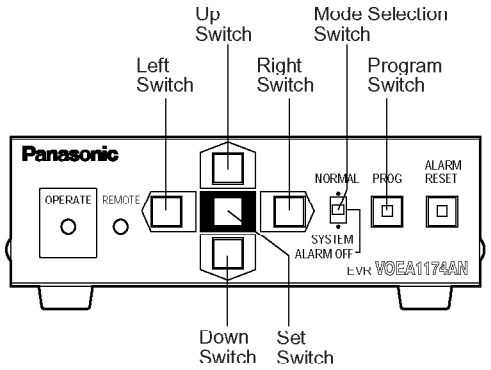
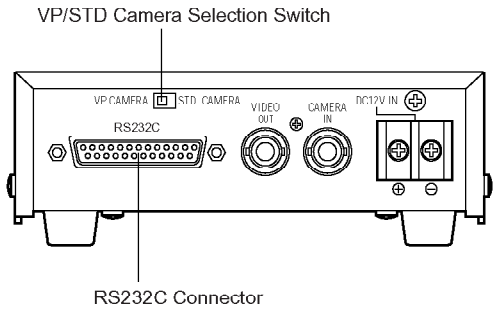


Fig. 4-1

4.2. Setting Up for New E.V.R. Adjustment Kit

< Remote E.V.R. Adjustment Kit >





< Switch Setting >

- Remove the Upper Cover.
- Set the switch SW3 on the board to the position as shown below.
- Set the VP/STD.CAMERA selection switch on the rear panel according to the camera.
- Set to VP CAMERA position for VP Multiplexed Camera.
- Set to STD CAMERA position for Standard Camera.

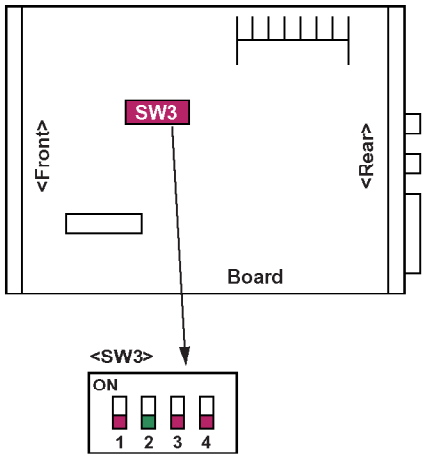
< Installing E.V.R. Adjustment Program >

- Make a copy of following necessory files to your computer from original floppy disk of the Remote E.V.R. Adjustment Kit.

  RADJ.EXE

  CP460E.SEQ

  CP460E.EVR



Select switch #2 to ON (PAL) or OFF (NTSC) position.

<SW3>

#	1	2	3	4
ON	—	PAL	—	—
OFF	FIX	NTSC	FIX	FIX

1. Confirm that the CONFIG.SYS file on your computer contains DEVICE=ANSI.SYS.
2. Insert floppy disk containing E.V.R.adjustment program into your floppy drive (for example,drive:A) and type **A:**
3. At the prompt, type **CD IBMPC** and press **ENTER** key.
4. Type **COPY RADJ.EXE B:** and press **ENTER** key.
5. Type **CD** and press **ENTER** key.
6. Type **CD PAL** and press **ENTER** key.
7. Type **COPY CP460E.SEQ B:** and press **ENTER** key.
8. After completing installation of program, you are ready to use the E.V.R. adjustment program.

4.3. Setting Up

- An initial setting of the Switch on the Left side Panel of the WV-CP460 and WV-CP464 as follows:
  Gen-Lock Termination Switch
  (G/L 75Ω/Hi-Z) ·····75Ω
- The adjustments should be done with this initial setting, unless otherwise specified.
- The adjustments should be done after 10 monuts warm up.

5. Adjustment Procedure

- Refer to the Location of the Test Points and Adjusting Controls on the page 11.

<Adjustment Procedure-1>

1. Flange-back Adjustment

Test Point: **CN2 (Video Output Connector)** **I/F Board**

Adjust: **Flange-back Adjusting Ring**

- Mount the ALC Lens WV-LA9C3B on the Camera.
- Set the Radiation Chart.
- Aim the Camera at the Radiation Chart distance of 10m.
- Set the Lens Focus Ring so that the Lens Focus positions approx. 9mm in front from infinity.
- Referring to Fig. 5-1, loosen the Focus-Fixing Screw that secure the Flange-back Adjusting Ring.
- Adjust the Flange-back Adjusting Ring to obtain best focal point.

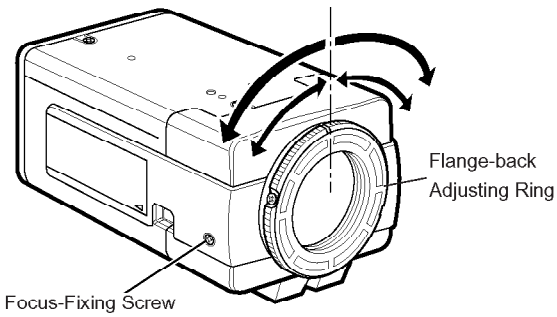


Fig. 5-1

- Tighten the Focus-Fixing Screw that secure the Flange-back Adjusting Ring carefully.
- Change the ALC Lens to WV-LA9C3A from WV-LA9C3B.

<Adjustment Procedure-2> (E.V.R. Adjustment)

- Insert new disk containing the E.V.R. Adjustment program into IBM PC/AT.
- To change communication mode of the camera, turn off the power for the camera.
- Turn on the power for the camera while pressing both Left and Right Buttons on the Left side panel of the camera.
- At the prompt, type **RADJ CP460E** and press the **ENTER** key, an initial menu will be displayed in Table 5-1.

```
PANASONIC REMOTE EVR ADJUSTMENT SYSTEM (C) MCI Co. CCTV PRODUCT:CP460 EEPROM:0
* * * * * * * * * * * * * * * * * * * * * * MENU * * * * * * * * * * * * * Page (1/1) * * * * * PAL
1.1. SC FREQUENCY
1.2. VS SC FREQUNCY
2. HI CLIP LEVEL
3. ALC DC
4. VIDEO OUT GAIN
5. PEDESTAL
6.1. BURST LEVEL
6.2. BURST LEVEL
6.3. BURST LEVEL
6.4. BURST LEVEL
7.1. WB 3200K MANU OFFSET R
7.2. WB 3200K MANU OFFSET B
8.1. WB 6500K ATW LIMIT R
8.2. WB 6500K ATW LIMIT B
9.1. 3200K R_GAIN
9.2. 3200K B_GAIN
9.3. 3200K MATRIX
10.1. 5100K R_GAIN
10.2. 5100K B_GAIN
11. HI LIGHT CHROMA CLIP
<CONTENTS>                                    17734470 + - 40Hz
<INSTRUCTION> PLEASE CHOOSE MENU DATA BY ARROW-KEY
  LOAD (F1)      QUIT (F3)      SAVE (F5)
```

Table 5-1

- Press the **SAVE(F5)** key of the Computer, then the Computer will ask you for the file name.
- Give appropriate file name to the Computer. But do not use **CP460E.EVR** for your file.
- This saving procedure is recommended to keep the current adjustment status of the Camera.
- Press the **LOAD(F1)** key and type **CP460E.EVR** and press the **ENTER** key for presetting adjustment of the Camera.

1.1. Subcarrier Frequency Adjustment

Menu: **1.1. SC FREQUENCY**

Test Point: **TD801 or TD802 (SC VCXO)** **Main Board**

- Connect the Frequncy Counter to TD802 or TD802.
- Adjust data with the **ARROW** keys so that the Subcarrier Frequency becomes 17.73447 MHz ± 40 Hz.
- Press the **ENTER** key for next adjustment.

1.2. VS Subcarrier Frequency Adjustment

Menu: **1.2. VS SC FREQUENCY**

Test Point: **TD801 or TD802 (SC VCXO)** **Main Board**

- Supply the Composite Video signal to the Gen-Lock input Connector (CN4 on the I/F Board) from the Video Signal Generator.
- Connect the Frequncy Counter to TD801 or TD802.
- Adjust data with the **ARROW** keys so that the Subcarrier Frequency becomes 17.73477 MHz ± 40 Hz.
- Press the **ENTER** key for next adjustment.

2. High Clip Adjustment

Menu: **2.HI CLIP LEVEL**

Test Point: **CN2 (Video Output Connector)** **I/F Board**

- Change the Colour Temperature from 5100K to 3200K by mounting the Colour Conversion Filter W12 on the Lens.
- Aim the Camera at the Logarithmic Gray Scale Chart.
- Connect the Oscilloscope to the Video Output Connector.
- Open the Lens Iris fully.
- Adjust data with the **ARROW** keys so that the signal level becomes 805 $^{+35}_{-0}$ mV as shown in Fig. 5-2.

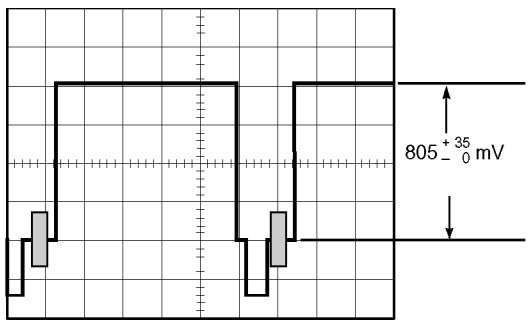


Fig. 5-2

- Press the **ENTER** key for next adjustment.

3. ALC DC Adjustment

Menu: **3. ALC DC**

Test Point: **CN2 (Video Output Connector)** **I/F Board**

- Keep the Colour Temperature at 3200K.
- Aim the Camera at the Logarithmic Gray Scale Chart.
- Open the Lens Iris.
- Adjust data with the **ARROW** keys so that the measure level becomes 00 and 05.
- Press the **ENTER** key for next adjustment.

4. Video Out Gain Adjustment

Menu: **4. VIDEO OUT GAIN**

Test Point: **CN2 (Video Output Connector)** **I/F Board**

- Keep the Colour Temperature at 3200K.
- Aim the Camera at the Logarithmic Gray Scale Chart.
- Connect the Oscilloscope to the Video Output Connector.
- Adjust data with the **ARROW** keys so that the Video signal level becomes 700 ± 50 mV as shown in Fig. 5-3.

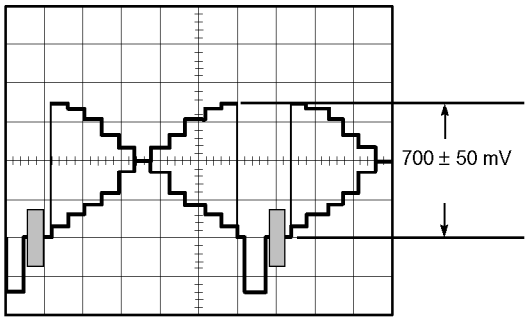


Fig. 5-3

- Press the **ENTER** key for next adjustment.

5. Pedestal Adjustment

Menu: **5. PEDESTAL**

Test Point: **CN2 (Video Output Connector)** **I/F Board**

- Connect the Oscilloscope to the Video Output Connector.
- Close the Lens Iris.
- Adjust data with the **ARROW** keys so that the Pedestal level becomes 50 ± 5 mV as shown in Fig. 5-4.

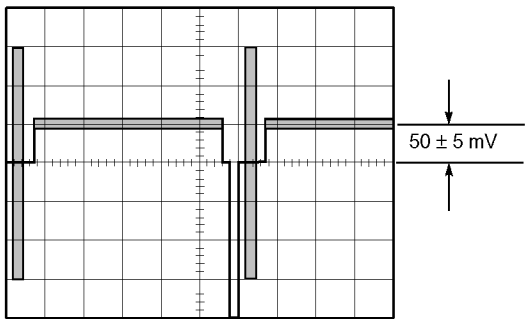


Fig. 5-4

- Press the **ENTER** key for next adjustment.

6. Burst Level Adjustment

- Repeat adjustment from steps **6.1** to **6.4** until Burst level, phase and Red vector phase are adjusted to proper position as shown in Fig.5-5, 5-6, 5-7 and Table 5-2.
- First, adjust the Burst Level and Phase according to following formula.
  DATA of **6.1** = DATA of **6.3**
  DATA of **6.2** = DATA of **6.4**
  Note the DATA at each adjustment step.
- Then adjust the Red vector and phase according to following formula.
  DATA of **6.1** → Current DATA + α
  DATA of **6.2** → Current DATA – α
  DATA of **6.3** → Current DATA – α
  DATA of **6.4** → Current DATA + α

6.1. Burst Level Adjustment

Menu: **6.1. BURST LEVEL**

Test Point: **CN2 (Video Output Connector)** **I/F Board**

- Keep the Colour Temperature at 3200K.
- Aim the Camera at the Colour Chip Chart.
- Connect the Oscilloscope to the Video Output Connector.
- Set the Mode Switch of the Vectorscope to NTSC mode.
- Adjust data with the **ARROW** keys so that the Burst level and phase are adjusted to proper position as shown in Fig. 5-6.
- Note the DATA for step **6.3**.
- Press the **ENTER** key for next adjustment

6.2. Burst Level Adjustment

Menu: **6.2. BURST LEVEL**

Test Point: **CN2 (Video Output Connector)** **I/F Board**

- Keep the Colour Temperature at 3200K.
- Aim the Camera at the Colour Chip Chart.
- Connect the Oscilloscope to the Video Output Connector.
- Adjust data with the **ARROW** keys so that the Burst level and phase are adjusted to proper position as shown in Fig. 5-6.
- Note the DATA for step **6.4**.
- Press the **ENTER** key for next adjustment.

6.3. Burst Level Adjustment

Menu: **6.3. BURST LEVEL**

Test Point: **CN2 (Video Output Connector)** **I/F Board**

- Keep the Colour Temperature at 3200K.
- Aim the Camera at the Colour Chip Chart.
- Connect the Oscilloscope to the Video Output Connector.
- Adjust data with the **ARROW** keys so that the data becomes same value of adjustment step **6.1**.
- Press the **ENTER** key for next adjustment.

6.4. Burst Level Adjustment

Menu: **6.4. BURST LEVEL**

Test Point: **CN2 (Video Output Connector)** **I/F Board**

- Keep the Colour Temperature at 3200K.
- Aim the Camera at the Colour Chip Chart.
- Connect the Oscilloscope to the Video Output Connector.
- Adjust data with the **ARROW** keys so that the data becomes same value of adjustment step **6.2**.

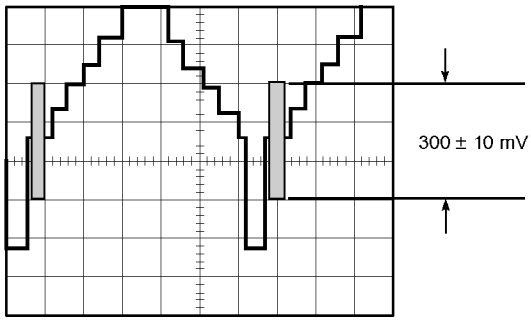


Fig. 5-5

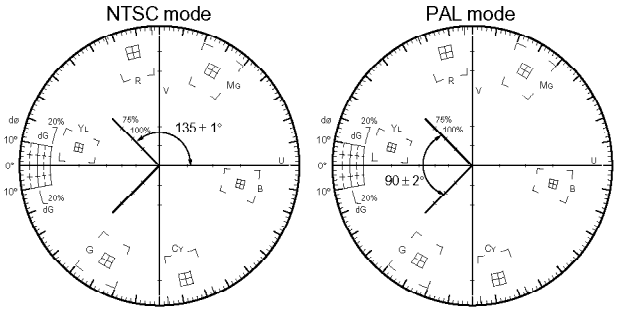


Fig. 5-6

- Select the item "6.1 BURST LEVEL" with the **ROLL DOWN** key and press the **ENTER** key.

6.1. Burst Level Adjustment

Menu: **6.1. BURST LEVEL**

Test Point: **CN2 (Video Output Connector)** **I/F Board**

- Keep the Colour Temperature at 3200K.
- Aim the Camera at the Colour Chip Chart.
- Connect the Oscilloscope to the Video Output Connector.
- Adjust data with the **ARROW** keys so that the data becomes +α from noted data.
- Press the **ENTER** key for next adjustment

6.2. Burst Level Adjustment

Menu: **6.2. BURST LEVEL**

Test Point: **CN2 (Video Output Connector)** **I/F Board**

- Keep the Colour Temperature at 3200K.
- Aim the Camera at the Colour Chip Chart.
- Connect the Oscilloscope to the Video Output Connector.
- Adjust data with the **ARROW** keys so that the data becomes –α from noted data.
- Press the **ENTER** key for next adjustment.

6.3. Burst Level Adjustment

Menu: **6.3. BURST LEVEL**

Test Point: **CN2 (Video Output Connector)** **I/F Board**

- Keep the Colour Temperature at 3200K.
- Aim the Camera at the Colour Chip Chart.
- Connect the Oscilloscope to the Video Output Connector.
- Adjust data with the **ARROW** keys so that the data becomes –α from noted data.
- Press the **ENTER** key for next adjustment.

6.4. Burst Level Adjustment

Menu: **6.4. BURST LEVEL**

Test Point: **CN2 (Video Output Connector)** **I/F Board**

- Keep the Colour Temperature at 3200K.
- Aim the Camera at the Colour Chip Chart.
- Connect the Oscilloscope to the Video Output Connector.
- Adjust data with the **ARROW** keys so that the data becomes +α from noted data.
- Press the **ENTER** key and **ROLL DOWN** Key to confirm Burst Level, Phase and Red Vector position within the specification as shown in Fig. 5-5, 5-6 , 5-7 and Table 5-2.

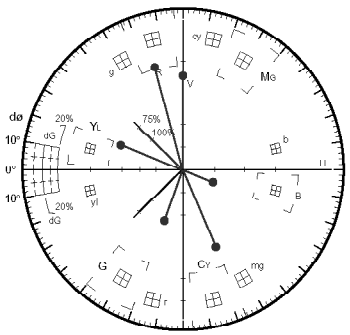


Fig. 5-7

	Red	Yellow
Phase	108 ± 2°	165 ± 5°
Gain	220 ± 5 %	100 ± 5 %

Table 5-2

- Repeat adjustment from **6.1** to **6.4** until Burst Level, Phase and Red Vector position are adjusted to proper position.
- Press the **ENTER** key for next adjustment.

7.1. White Balance 3200K Manual Offset R Adjustment

Menu: **7.1. WB 3200K MANU OFFSET R**

Test Point: **CN2 (Video Output Connector) I/F Board**

- Keep the Colour Temperature at 3200K.
- Aim the Camera at the White Chart or White Paper.
- Set the Gain Control of the Vectorscope to maximum.
- Adjust data with the **ARROW** keys so that the vector positions at the center of the Vectorscope as shown in Fig.5-8.

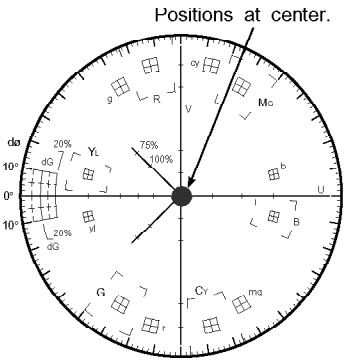


Fig. 5-8

- Press the **ENTER** key for next adjustment.

7.2. White Balance 3200K Manual Offset B Adjustment

Menu: **7.2. WB 3200K MANU OFFSET B**

Test Point: **CN2 (Video Output Connector) I/F Board**

- Keep the Colour Temperature at 3200K.
- Aim the Camera at the White Chart or White Paper.
- Set the Gain Control of the Vectorscope to maximum.
- Adjust data with the **ARROW** keys so that the vector positions at the center of the Vectorscope as shown in Fig.5-9.

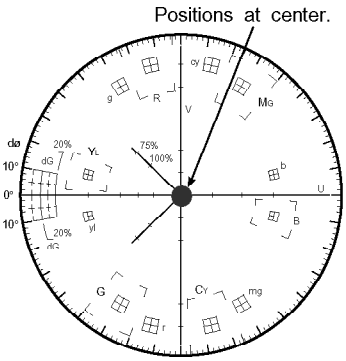


Fig. 5-9

- Repeat adjustment steps **7.1** and **7.2** until vector positions at the center of the Vectorscope.
- Press the **ENTER** key for next adjustment.

8.1. White Balance 6500K ATW Limit R Adjustment

Menu: **8.1. WB 6500K ATW LIMIT R**

Test Point: **CN2 (Video Output Connector) I/F Board**

- Aim the Camera at the White Chart or White Paper.
- Change the Colour Temperature from the 3200K to 6500K by replacing Colour Conversion Filter from W12 to C4.
- Set the Gain Control of the Vectorscope to maximum.
- Adjust data with the **ARROW** keys so that the vector shifts 10% (Burst=100%) to the Cyan side of the Vectorscope as shown in Fig.5 -10.

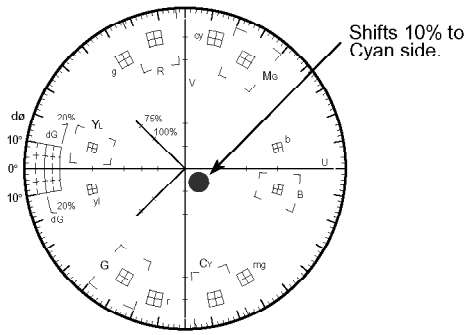


Fig. 5-10

- Press the **ENTER** key for next adjustment.

8.2. White Balance 6500K ATW Limit B Adjustment

Menu: **8.2. WB 6500K ATW LIMIT B**

Test Point: **CN2 (Video Output Connector) I/F Board**

- Aim the Camera at the White Chart or White Paper.
- Keep the Colour Temperature at 6500K.
- Set the Gain Control of the Vectorscope to maximum.
- Adjust data with the **ARROW** keys so that the vector shifts 10% (Burst=100%) to the Cyan side of the Vectorscope as shown in Fig.5-11.

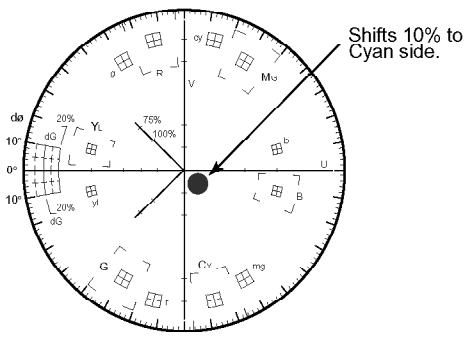


Fig. 5-11

- Repeat adjustment steps **8.1** and **8.2** until vector shifts 10% (Burst=100%) to the Cyan side of the Vectorscope.
- Press the **ENTER** key for next adjustment.

9.1. 3200K R Gain Adjustment

Menu: **9.1. 3200K R_GAIN**

Test Point: **CN2 (Video Output Connector)** **I/F Board**

- Aim the Camera at the Colour Chip Chart.
- Return the Colour Temperature from the 6500K to 3200K by replacing Colour Conversion Filter from C4 to W12.
- Adjust data with the **ARROW** keys so that the Red gain becomes 220 ± 5%.
- Press the **ENTER** key for next adjustment.

Note: Chrominance phase and gain are adjusted to proper position as shown in Fig. 5-12 and Table 5-3.

9.2. 3200K B Gain Adjustment

Menu: **9.2. 3200K B_GAIN**

Test Point: **CN2 (Video Output Connector)** **I/F Board**

- Keep the Colour Temperature at 3200K.
- Adjust data with the **ARROW** keys so that the Yellow gain becomes 100 ± 5%.
- Press the **ENTER** key for next adjustment.

Note: Chrominance phase and gain are adjusted to proper position as shown in Fig. 5-12 and Table 5-3.

9.3. 3200K Matrix Adjustment

Menu: **9.3. 3200K MATRIX**

Test Point: **CN2 (Video Output Connector)** **I/F Board**

- Keep the Colour Temperature at 3200K.
- Adjust data with the **ARROW** keys so that the Red vector phase becomes 108 ± 2°.
- Repeat adjustment from steps **9.1** to **9.3** until both chrominance phase and gain are adjusted to proper position as shown in Fig. 5-12 and Table 5-3.

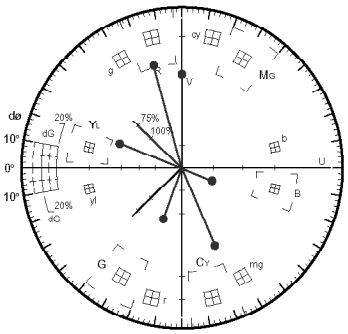


Fig. 5-12

	Red	Yellow
Phase	108 ± 2°	165 ± 5°
Gain	220 ± 5 %	100 ± 5 %

Table 5-3

- Press the **ENTER** key for next adjustment.

10.1. 5100K R Gain Adjustment

Menu: **10.1. 5100K R_GAIN**

Test Point: **CN2 (Video Output Connector)** **I/F Board**

- Aim the Camera at the Colour Chip Chart.
- Change the Colour Temperature from the 3200K to 5100K by removing the Colour Conversion Filter from the Lens.
- Adjust data with the **ARROW** keys so that the Red gain becomes 220 ± 5%.
- Press the **ENTER** key for next adjustment.

10.2. 5100K B Gain Adjustment

Menu: **10.2. 5100K B_GAIN**

Test Point: **CN2 (Video Output Connector)** **I/F Board**

- Keep the Colour Temperature at 5100K.
- Adjust data with the **ARROW** keys so that the Yellow gain becomes 100 ± 5 %.
- Repeat adjusment from steps **10.1** and **10.2** until both chrominance phase and gain are adjusted to proper position as shown in Fig. 5-13 and Table 5-4.

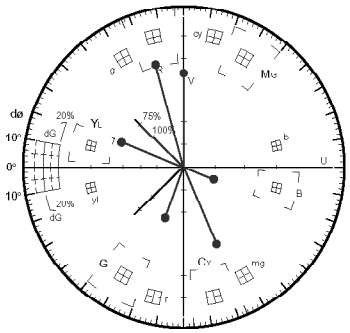


Fig. 5-13

	Red	Yellow
Phase	108 ± 2°	165 ± 5°
Gain	220 ± 5 %	100 ± 5 %

Table 5-4

- Press the **ENTER** key for next adjustment.

11. High light Chroma Clip Adjustment

Menu: **11. HI LIGHT CHROMA CLIP**

Test Point: **CN2 (Video Output Connector) I/F Board**

Adjust: **RAM8 (01F)**

- Aim the Camera at the White Chart or White Paper.
- Return the Colour Temperature from the 5100K to 3200K by mounting the Colour Conversion Filter W12 on the Lens.
- Adjust data with the **ARROW** keys so that the false chrominance level becomes minimum as shown in Fig. 5-14.

Note: The Data of 01F should be adjusted from FF, the first minimum point of the false chrominance signal is as adjusting point.

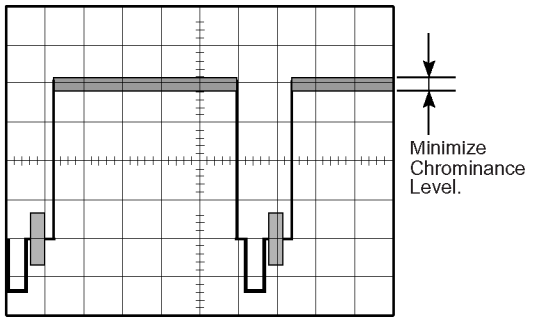
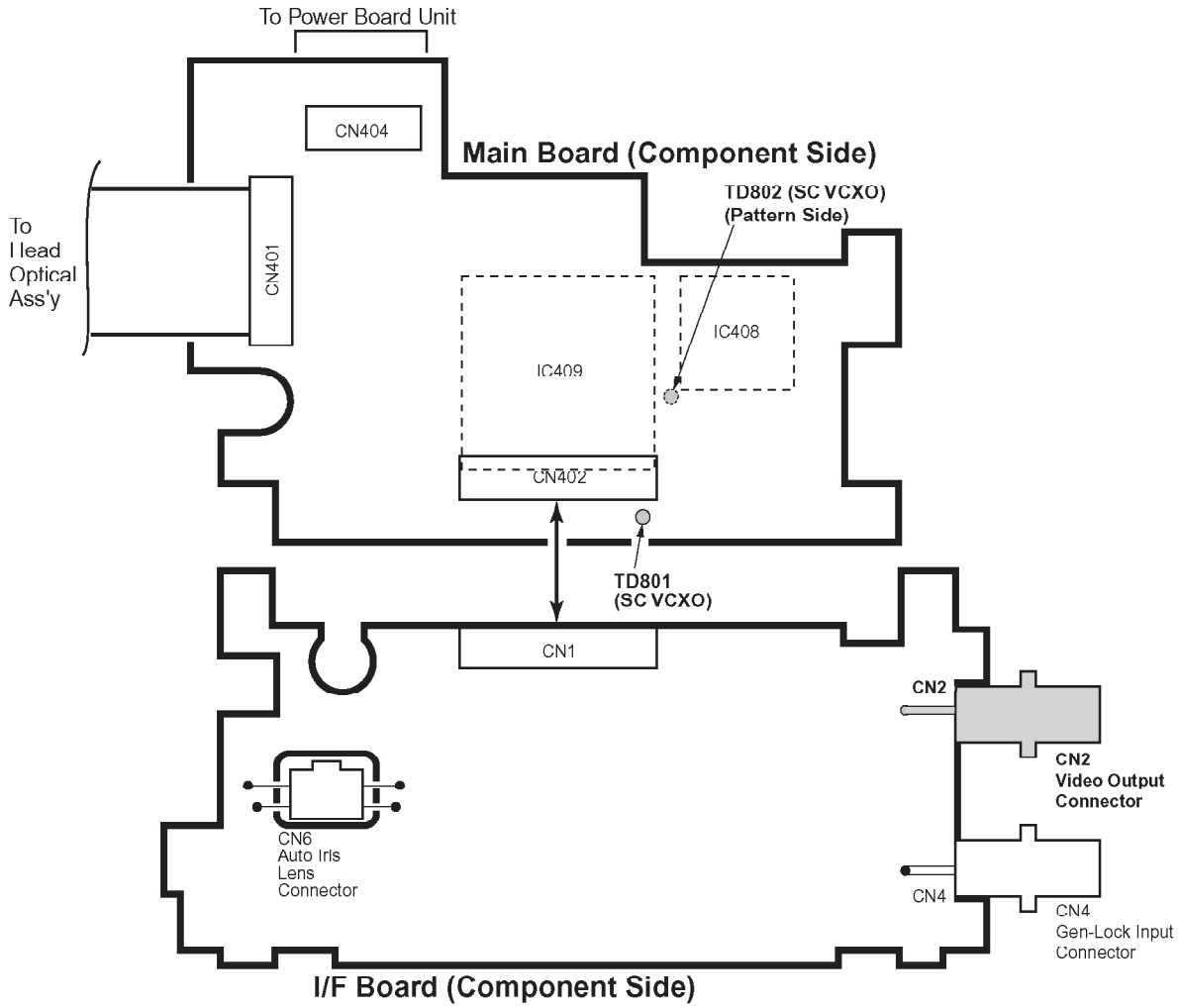


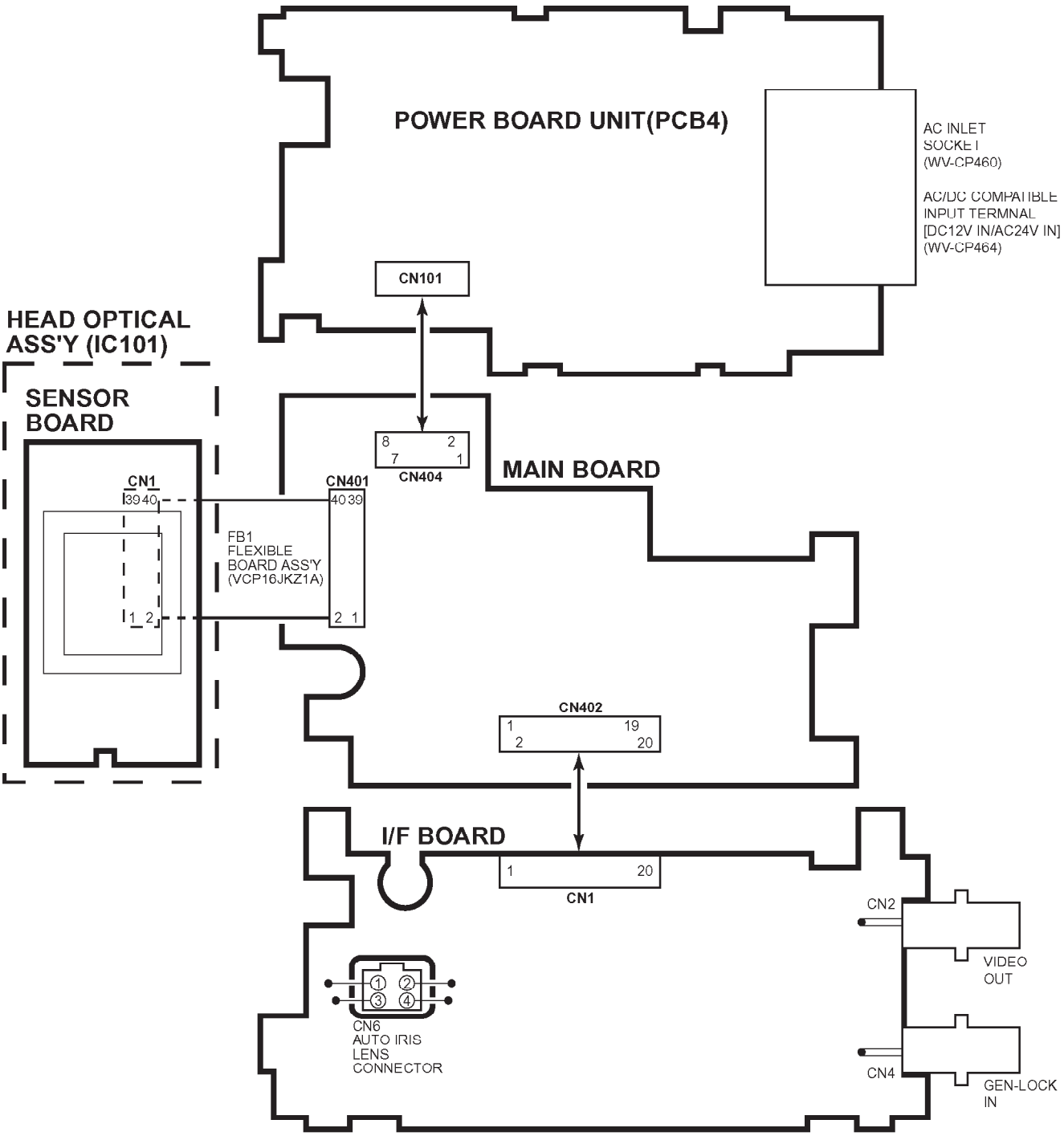
Fig. 5-14

- After completing of the adjustment, press the **QUIT (F3)** key, then the menu as shown in "<SAVE CAMERA DATA TO FILE : ✻✻✻ , EVR? Y/N> will be displayed.
- Press the **N** key, and then press the **ENTER** key to finish of this adjustment procedure.

LOCATION OF TEST POINTS AND ADJUSTING CONTROLS

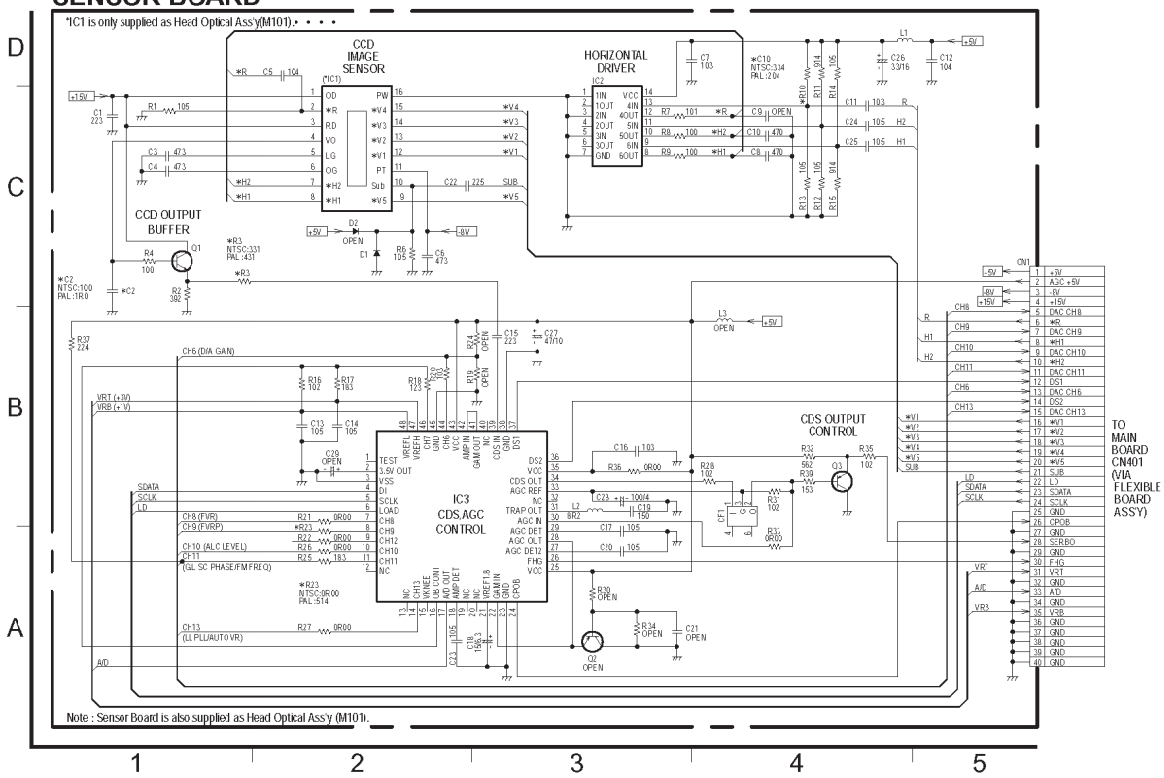


WIRING DIAGRAM



SCHEMATIC DIAGRAM OF SENSOR BOARD

SENSOR BOARD


*IC1 is only supplied as Head Optical Ass'y(M101).
CCD IMAGE SENSOR
HORIZONTAL DRIVER
CCD OUTPUT BUFFER
IC3 CDS,AGC CONTROL
CDS OUTPUT CONTROL
TO MAIN BOARD CN401 (VIA FLEXIBLE BOARD ASS'Y)
Note : Sensor Board is also supplied as Head Optical Ass'y (M101).

<Index>

SENSOR BOARD

IC2	D3
IC3	B2
Q1	C1
Q3	B4
D1	C2

Note:
The value indicated in the schematic diagram should be read as follows:

Multiplier (0–5)
2nd Significant Digit (0–9)
1st Significant Digit (0–9)

<Example>
For Resistor:
330 → 33 x 10^0 = 33 Ω
561 → 56 x 10^1 = 560 Ω
123 → 12 x 10^3 = 12k Ω
0R00=0 Ω

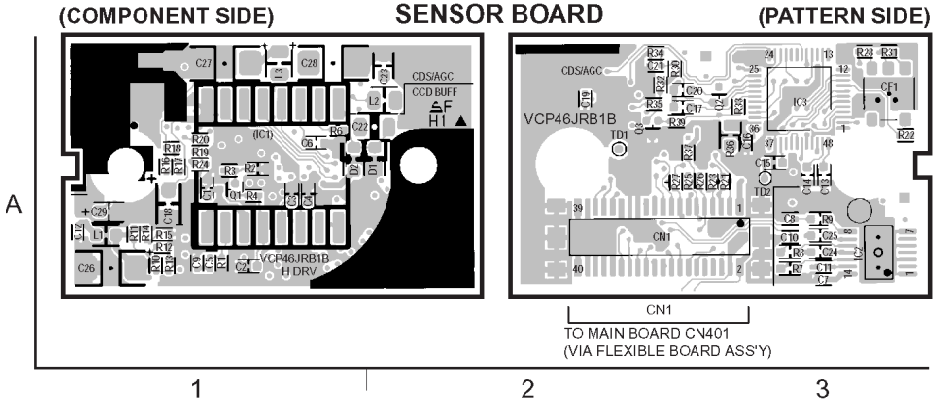
For Capacitor (Exclude Electrolytic and Tantalum Capacitor):
820 → 82 x 10^0 = 82PF
102 → 10 x 10^2 = 1,000PF = 0.001μF
104 → 10 x 10^4 = 100,000PF = 0.1μF

For Coi :
270 → 27 x 10^0 = 27 μH
101 → 10 x 10^1 = 100 μH
8R2 = 8.2 μH

CONDUCTOR VIEW OF SENSOR BOARD

SENSOR BOARD

(COMPONENT SIDE) (PATTERN SIDE)

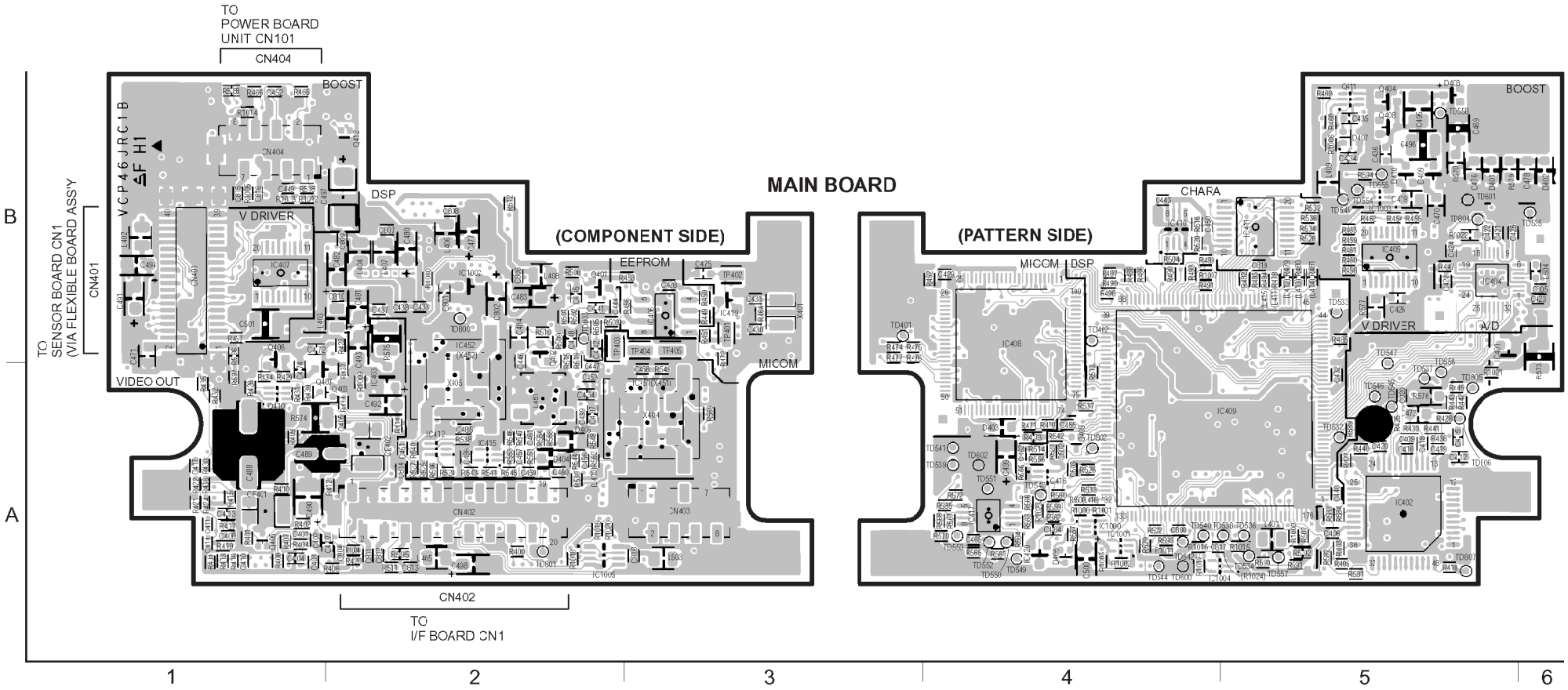


<Index>

SENSOR BOARD

IC2	A3
IC3	A3
Q1	A1
Q3	A2
D1	A2

CONDUCTOR VIEW OF MAIN BOARD



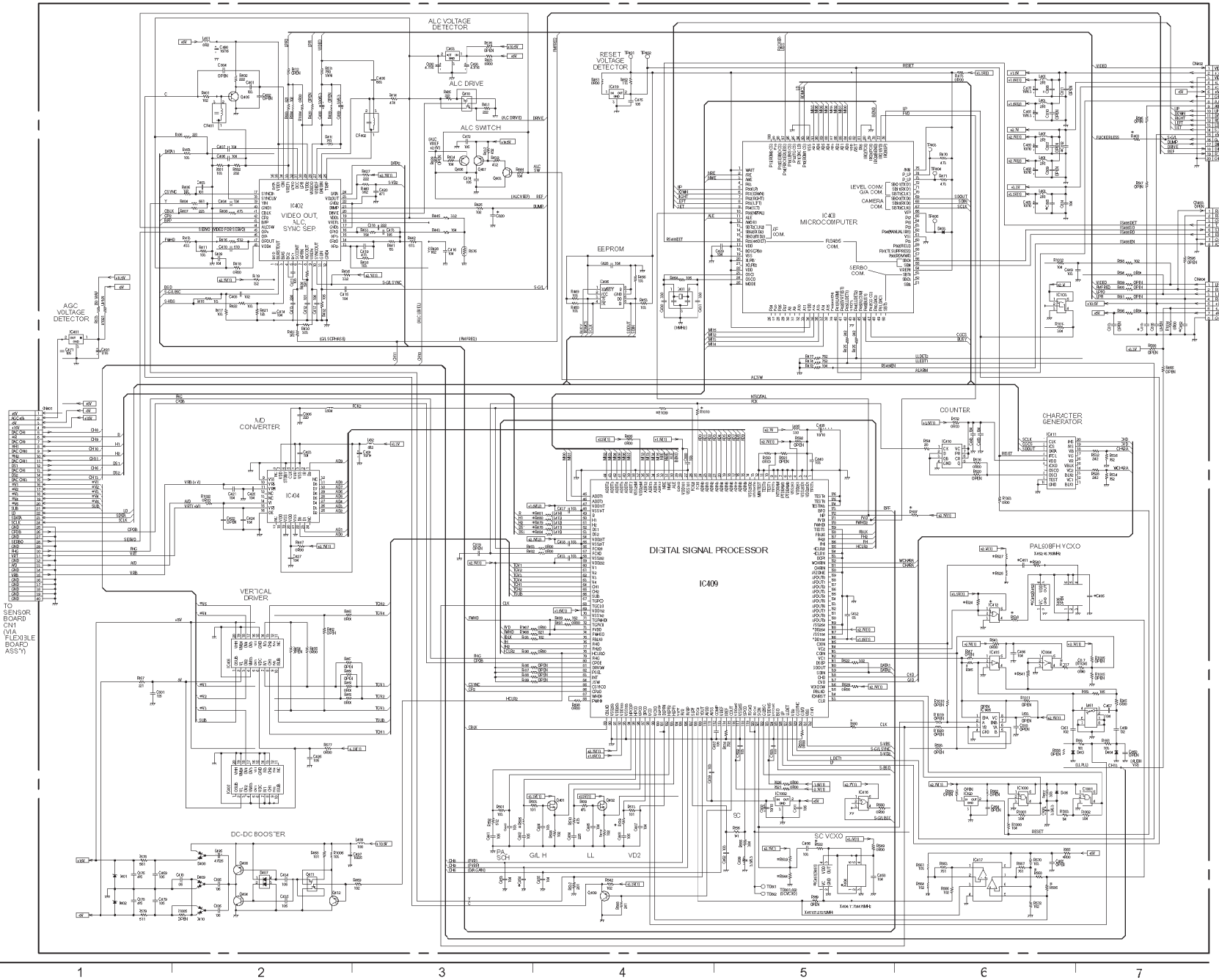
<Index>

MAIN BOARD

IC401	B5	IC412	A2	Q402	B2	D401	B5
IC402	A5	IC415	A2	Q403	A2	D402	B6
IC403	A2	IC416	A4	Q404	B5	D403	A4
IC404	A5	IC417	A4	Q405	A1	D404	A2
IC405	A5	IC419	B3	Q406	B1	D405	A2
IC406	B3	IC1000	A4	Q407	A1	D406	A4
IC407	B1	IC1001	A4	Q408	B5	D407	B5
IC408	B4	IC1002	B2	Q409	A4	D408	B5
IC409	A5	IC1003	B5	Q410	A1	D409	B5
IC410	B4	IC1004	A4	Q411	B5	D410	B5
IC411	B5	Q401	B2	Q412	B2		

SCHEMATIC DIAGRAM OF MAIN BOARD

MAIN BOARD



<Index>

MAIN BOARD

IC401	D1
IC402	E2
IC403	F3
IC404	C2
IC405	B2
IC406	D4
IC407	A2
IC408	E5
IC409	C4
IC410	C6
IC411	C6
IC412	B6
IC415	B6
IC416	A5
IC417	A6
IC419	E4
IC1000	A6
IC1001	A7
IC1002	A5
IC1003	D6
IC1004	B6
Q401	A4
Q402	A4
Q403	E3
Q404	A2
Q405	E2
Q406	E3
Q407	E3
Q408	A2
Q409	A4
Q410	E3
Q411	A2
Q412	A2
D401	A1
D402	A1
D403	E6
D404	B7
D405	B7
D406	A6
D407	A2
D408	A2
D409	A2
D410	A2

★ marked parts are shown in below.

Ref. No.	NTSC	PAL
IC412	OPEN	MOUNT
R460	0R00	OPEN
R478 (L4'1')	750	OPEN
R479 (L4'2')	OPEN	MOUNT
R479 (L4'3')	100	OPEN
R480 (L4'3')	OPEN	MOUNT
R481 (L4'4')	100	OPEN
R484 (L4'5')	OPEN	MOUNT
R565	750	OPEN
R567	512	163
R569	OPEN	0R00
R574	OPEN	104
R575	OPEN	684
R577	OPEN	394
R578	OPEN	0R00
R579	OPEN	105
R580	OPEN	201
R581	331	391
R584	104	124
R585	105	0R00
R590 (L4'6')	330	OPEN
R592 (L4'6')	OPEN	201
R598	102	OPEN
R595	OPEN	0R00
R1009	221	271
R1010	100	0R00
R1017	0R00	391
C461	OPEN	105
C462	104	OPEN
C464	224	105
C465	OPEN	104
C595	104	OPEN
C596	OPEN	104
C8 2	OPEN	104
C8 5	104	OPEN
C850	OPEN	561
X464	OPEN	MOUNT
IC451 (L4'1')	MOUNT	OPEN
IC452 (X462)	OPEN	MOUNT

Note:
The value indicated in the schematic diagram should be read as follows:

- Multiplier (0–6)
- 2nd Significant Digit (0–9)
- 1st Significant Digit (0–9)

<Example>

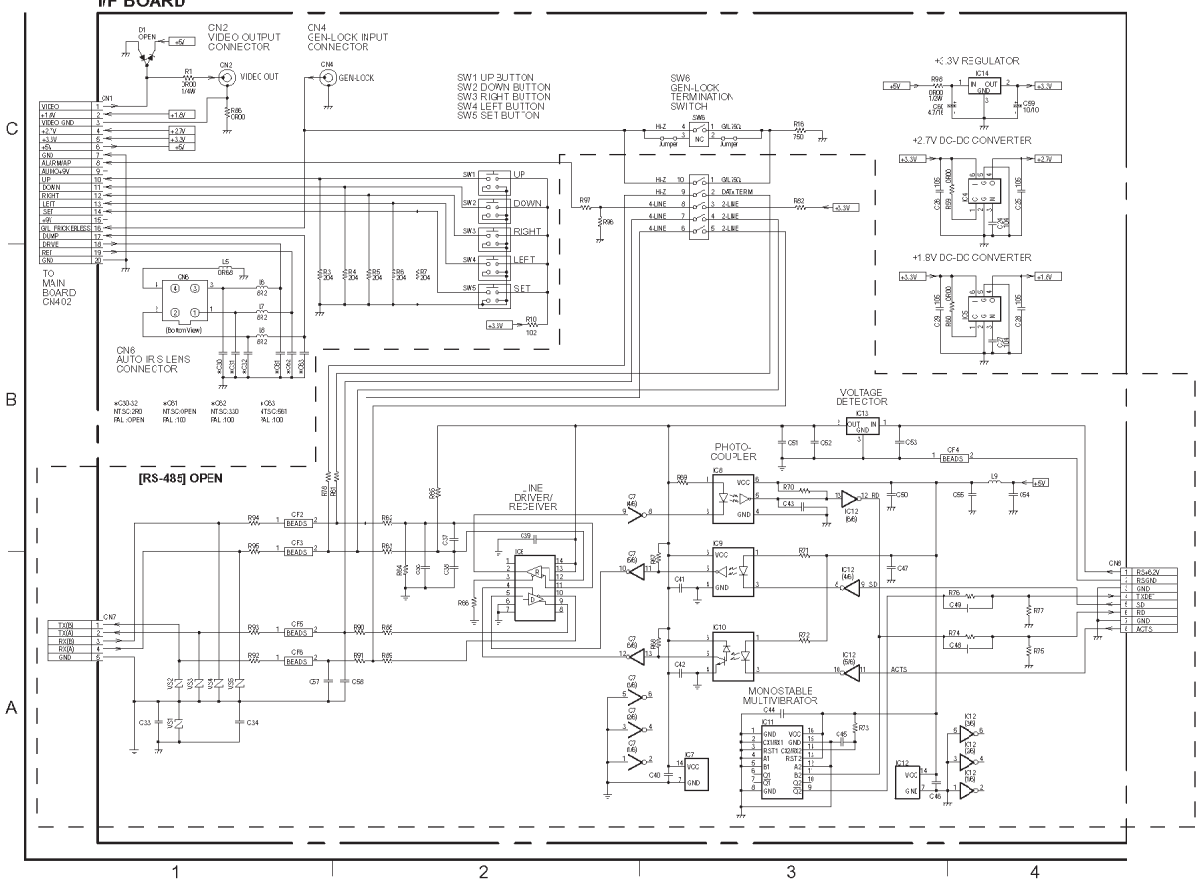
For Resistor:
330 → 33 X 10^0= 33 Ω
561 → 56 X 10^1= 560 Ω
123 → 12 X 10^3= 13K Ω
0R0=0 Ω

For Capacitor (Exclude Electrolytic and Tantalum Capacitor):
820 → 82 X 10^0= 82PF
102 → 10 X 10^2= 1,000PF = 0.001μF
104 → 10 X 10^4= 100,000PF = 0.1μF

For Coil:
270 → 27 X 10^0= 27 μH
101 → 10 X 10^1= 100 μH
8R2= 8.2 μH

SCHEMATIC DIAGRAM OF I/F BOARD

I/F BOARD



<Index>

I/F BOARD

IC4	C4
IC5	B4
IC14	C4

Note:
The value indicated in the schematic diagram should be read as follows:

<Example>

For Resistor:
330 → 33 x 10⁰= 33 Ω
561 → 56 x 10¹= 560Ω
123 → 12 x 10³= 12kΩ
0R00=0 Ω

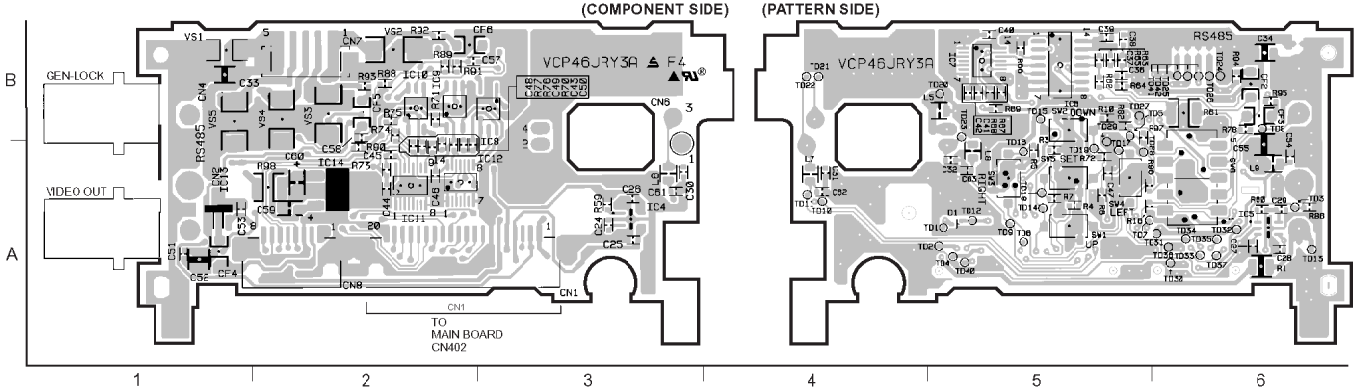
For Capacitor (Exclude Electrolytic and Tantalum Capacitor):
820 → 82 x 10⁰= 82PF
102 → 10 x 10²= 1,000PF = 0.001μF
104 → 10 x 10⁴= 100,000PF = 0.1μF

For Coil:
270 → 27 x 10⁰= 27 μH
101 → 10 x 10¹= 100μH
8R2 = 8.2 μH

CONDUCTOR VIEW OF I/F BOARD

I/F BOARD

(COMPONENT SIDE) (PATTERN SIDE)



<Index>

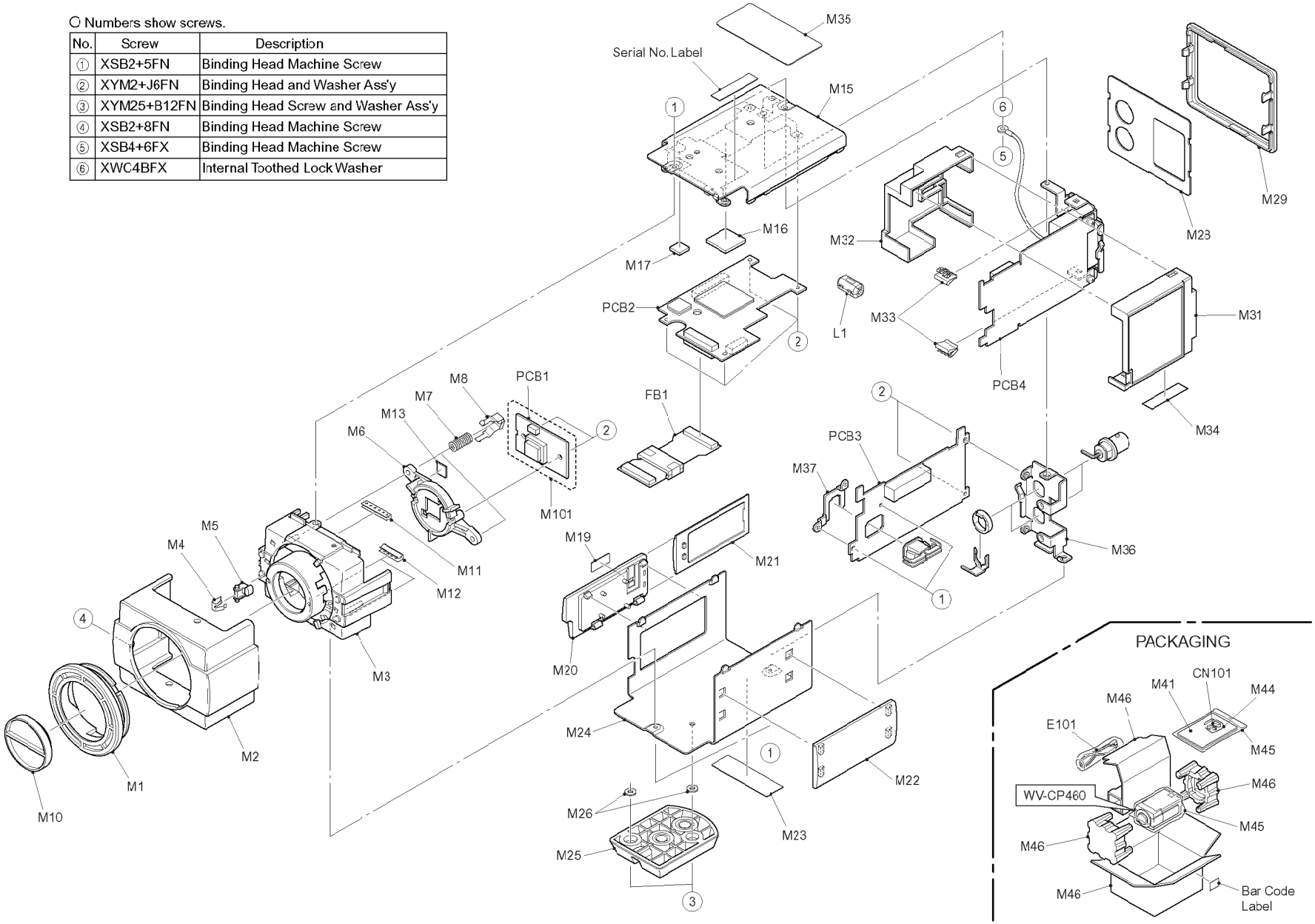
I/F BOARD

IC4	A3
IC5	A6
IC14	A2

EXPLODED VIEW OF WV-CP460

○ Numbers show screws.

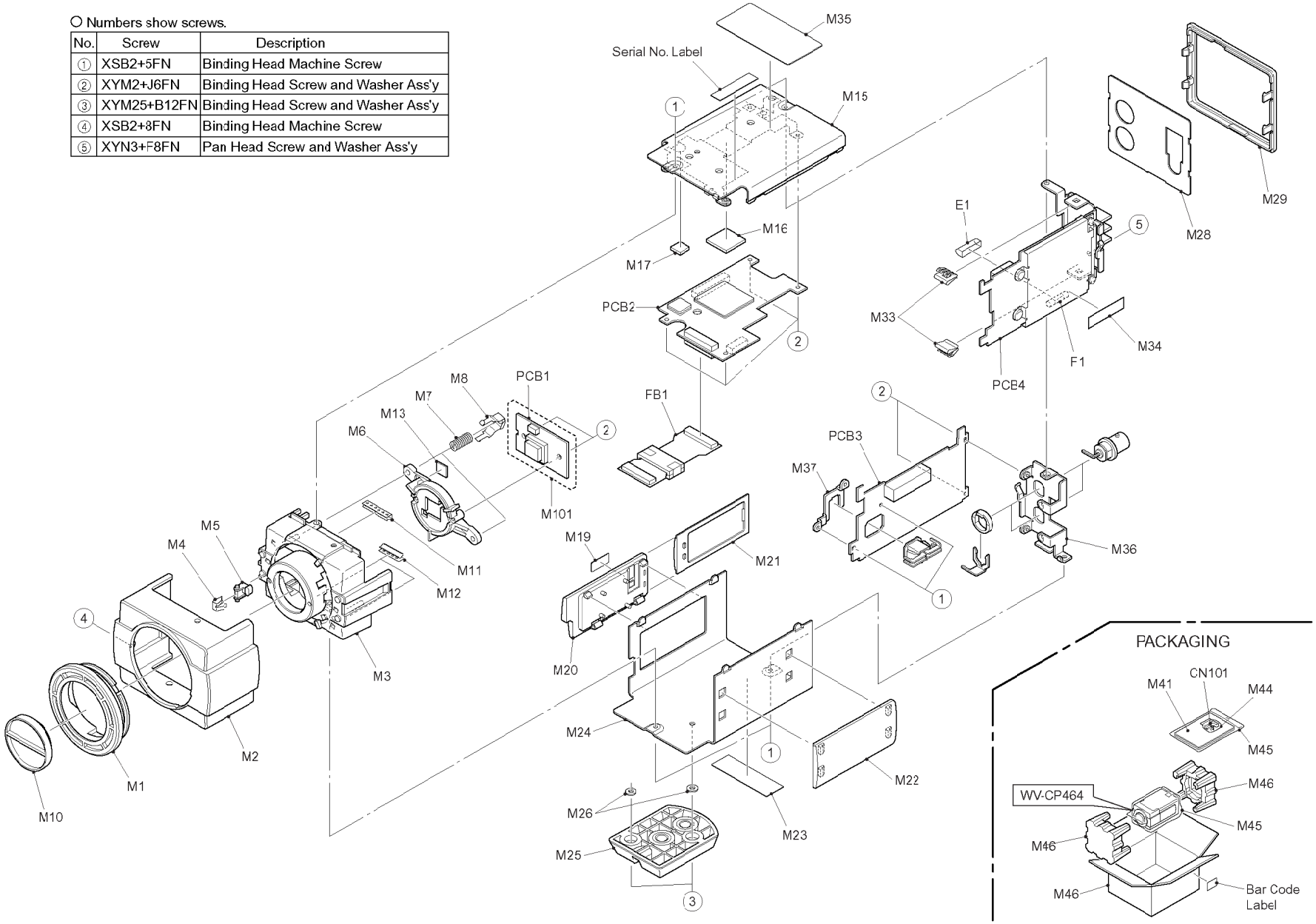
No.	Screw	Description
①	XSB2+5FN	Binding Head Machine Screw
②	XYM2+J6FN	Binding Head and Washer Ass'y
③	XYM25+B12FN	Binding Head Screw and Washer Ass'y
④	XSB2+8FN	Binding Head Machine Screw
⑤	XSB4+6FX	Binding Head Machine Screw
⑥	XWC4BFX	Internal Toothed Lock Washer



EXPLODED VIEW OF WV-CP464

○ Numbers show screws.

No.	Screw	Description
①	XSB2+5FN	Binding Head Machine Screw
②	XYM2+J6FN	Binding Head Screw and Washer Ass'y
③	XYM25+B12FN	Binding Head Screw and Washer Ass'y
④	XSB2+8FN	Binding Head Machine Screw
⑤	XYN3+F8FN	Pan Head Screw and Washer Ass'y



REPLACEMENT PARTS LIST

Important Notice

1. Components identified by " ⚠ " mark have special characteristics important for safety.
   When replacing any of these components, use only manufacturer's specified parts.
2. RTL : Retention Time Limited (No longer available after discontinuing product).

REF. NO.		PART NO.	DESCRIPTION
MISCELLANEOUS			
FB1		VCP16JKZ1A	Flexible Board Ass'y
M101		V0EA1284AN	Head Optical Ass'y
PCB4		ETXMC277E0E	Power Board Unit for WV-CP460/G
		ETXMC277X0E	Power Board Unit for WV-CP464E
F1		K5Y312B00002	Current Fuse for WV-CP464E
E1		YW840522	Fuse Cover for WV-CP464E
L1		J0KG00000001	Ferrite Core for WV-CP460/G
M1	⚠	V3FA1069B3	Flange-back Adjusting Ring
M2	⚠	V5EA2429B2	Front Cover
M3		V5BA1049D2	Front Escutcheon
M4		V4JA1133A4	Flange-back Lock Spring
M5		V4RA1017A4	Flange-back Lock Lever
M6		V4FA1041A3	IR Bracket
M7		V4JA1137A4	Spring
M8		V4JA1134A4	Stopper
M10		YWBC-2B	Body Cap
M11		V4JA1138A3	Earth Spring A
M12		V4JB1138A3	Earth Spring B
M13	⚠	V2FA1286A4	Cushion (CCD)
M15		V9AA2753C3	Main Chassis Ass'y
M16	⚠	V2FA1253A4	Cushion (DSP)
M17	⚠	V2FA1254A4	Cushion (IC)
M19		V7SC3618A4	Dip Switch Label
M20	⚠	V9AA2752B3	Side Switch Panel Ass'y
M21	⚠	V5EA2430A3	Side Switch Cover for WV-CP460/G
	⚠	V5EB2430A3	Side Switch Cover for WV-CP464E
M22		V5WA2588A3	System Panel (Right Side)
M23	⚠	YFV7MA0099A4	Safty Label
M24		V5EA2431A2	Main Cover
M25	⚠	V2TA1067A3	Mounting Bracket
M26		YWV1KA0128A4	Washer
M28	⚠	V5WC2586A4	Rear Panel for WV-CP460/G
		V5WA2587A4	Rear Panel for WV-CP464E
M29	⚠	V5BA1050A3	Rear Escutcheon for WV-CP460/G
M31	⚠	V5KA2303A3	Insulator Case for WV-CP460/G
M32	⚠	YWV6EA1032A3	Insulator Lid for WV-CP460/G
M33		V4JA1136A4	Earth Spring
M34	⚠	V7MA1108A4	Safety Label for WV-CP460/G
		V7MA1110A4	Safety Label for WV-CP464E
M35	⚠	V7QA5428A4	Main Label for WV-CP460/G
		V7QA5430A4	Main Label for WV-CP464E

REF. NO.	PART NO.	DESCRIPTION	
SENSOR BOARD			
PCB1(RTL)	————	Printed Circuit Board Ass'y	
IC2	C0JBAB000196	IC	
IC3	AN2191FHQ	IC	
Q1	B1BBAB000016	Transistor	
Q3	B1ADCF000040	Transistor	
D1	MA2Z72800L	Diode	
R1	ERJ2GEJ105X	Carbon	1M ohms 1/16W
R2	ERJ3GEYJ392V	Carbon	3.9K ohms 1/16W
R3	ERJ2GEJ431X	Carbon	430 ohms 1/16W
R4	ERJ2GEJ100X	Carbon	10 ohms 1/16W
R6	ERJ2GEJ105X	Carbon	1M ohms 1/16W
R7	ERJ3GEYJ101V	Carbon	100 ohms 1/16W
R8,9	ERJ3GEYJ100V	Carbon	10 ohms 1/16W
R10	ERJ2GEJ204X	Carbon	200K ohms 1/16W
R11	ERJ2GEJ914X	Carbon	910K ohms 1/16W
R12-14	ERJ2GEJ105X	Carbon	1M ohms 1/16W
R15	ERJ2GEJ914X	Carbon	910K ohms 1/16W
R16	ERJ2GEJ102X	Carbon	1K ohms 1/16W
R17	ERJ2GEJ183	Carbon	18K ohms 1/16W
R18	ERJ2GEJ123	Carbon	12K ohms 1/16W
R20	ERJ2GEJ103X	Carbon	10K ohms 1/16W
R21,22	ERJ2GE0R00X	Carbon	0 ohm 1/16W
R23	ERJ2GEJ514X	Carbon	510K ohms 1/16W
R25	ERJ2GEJ183	Carbon	18K ohms 1/16W
R26,27	ERJ2GE0R00X	Carbon	0 ohm 1/16W
R28,31	ERJ2GEJ102X	Carbon	1K ohms 1/16W
R32	ERJ2GEJ562	Carbon	5.6K ohms 1/16W
R33	ERJ2GE0R00X	Carbon	0 ohm 1/16W
R35	ERJ2GEJ102X	Carbon	1K ohms 1/16W
R36	ERJ6GEY0R00V	Carbon	0 ohm 1/10W
R37	ERJ2GEJ224X	Carbon	220K ohms 1/16W
R39	ERJ2GEJ153X	Carbon	15K ohms 1/16W
C1	F1H1E2230006	Ceramic	0.022 µF
C2	F1H1H1R0A260	Ceramic	1 pF
C3,4	F1H1E4730002	Ceramic	0.047 µF
C5	MCUV1C104ZFQ	Ceramic	0.1 µF
C6	F1H1E4730002	Ceramic	0.047 µF
C7	YW36B103K1T	Ceramic	0.01 µF
C8	YW36CH470J5T	Ceramic	47 pF
C10	YW36CH470J5T	Ceramic	47 pF
C11	YW36B103K1T	Ceramic	0.01 µF
C12	MCUV1C104ZFQ	Ceramic	0.1 µF
C13,14	F1H1A105A004	Ceramic	1 µF
C15	F1H1E223A002	Ceramic	0.022 µF
C16	YW36B103K1T	Ceramic	0.01 µF

REF. NO.	PART NO.	DESCRIPTION	
C17	F1H0J105A001	Ceramic	1 µF
C18	F3H0J1560001	Tantalum	15 µF 6.3V
C19	YW36CII150J5T	Ceramic	15 pF
C20	F1H0J105A001	Ceramic	1 µF
C22	YW426225FZT	Ceramic	2.2 µF
C23	MCUV1A105KBN	Ceramic	1 µF
C24,25	F1H0J105A001	Ceramic	1 µF
C26	ECST1CC336R	Tantalum	33 µF 16V
C27	ECST1AC476R	Tantalum	47 µF 10V
C28	ECST0GC107R	Tantalum	100 µF 4V
L1	J0JDC0000016	Coil	
L2	ELJFC8R2MF	Coil	8.2 µH
CF1	YWFSW1497	LC Filter	
CN1	K1KA40A00102	40-pin Connector	

MAIN BOARD

PCB2 (RTL)	VCP46EKC1A	Printed Circuit Board Ass'y	
IC401	XC62AP4702MR	IC	
IC402	AN9DE01F	IC	
IC403	XC62AP4702MR	IC	
IC404	YWTDA8766GCS	IC	
IC405	MN3112SA-E1	IC	
IC406	YWBR9040FE2	IC	
IC407	MN3112SA-E1	IC	
IC408	MN102HF55GHL	IC	
IC409	MN67354	IC	
IC410	YWTC7WH74FU	IC	
IC411	YWD6462GS905	IC	
IC412	C0JBAE000140	IC	
IC415	YWTC7SU04FUL	IC	
IC416	C0JBAE000087	IC	
IC417	C0ABBA000025	IC	
IC419	MN13821-JP	IC	
IC452(X452)	H1C5675B0001	Crystal Oscillator	
IC1000,1001	YWTC7S08FUL	IC	
IC1002	C0CBABE00001	IC	
IC1003	YWTC7S08FUL	IC	
IC1004	C0JBAB000175	IC	
Q401,402	2SK10694TL	FET	
Q403	B1ABCF000060	Transistor	
Q404	2SD18200WL	Transistor	
Q405	B1ADCF000040	Transistor	
Q406,407	2SB1218AHL	Transistor	
Q408	2SB12190WL	Transistor	
Q409	B1ADCF000040	Transistor	
Q410,411	UMZ1TL	Transistor	

REF. NO.	PART NO.	DESCRIPTION	
Q412	B1ADCF000040	Transistor	
D401	MAZ81500ML	Diode	
D402	MAZ81000HL	Diode	
D403	MA2Z72900L	Diode	
D404,405	YWHVU359TRF	Diode	
D406	B0ACCJ000014	Diode	
D407	YWDA227TL	Diode	
D408-410	MA3Z79300L	Diode	
R401	ERJ2GEJ102X	Carbon	1K ohms 1/16W
R402	ERJ2GEJ222	Carbon	2.2K ohms 1/16W
R403	ERJ2GEJ103X	Carbon	10K ohms 1/16W
R404	ERJ2GEJ561	Carbon	560 ohms 1/16W
R405	ERJ2GEJ223	Carbon	22K ohms 1/16W
R406	ERJ2GEJ122X	Carbon	1.2K ohms 1/16W
R407	ERJ2GEJ223	Carbon	22K ohms 1/16W
R408	ERJ2GEJ473X	Carbon	47K ohms 1/16W
R410	ERJ2GEJ751	Carbon	750 ohms 1/16W
R411	ERJ2GEJ103X	Carbon	10K ohms 1/16W
R413	ERJ2GEJ433	Carbon	43K ohms 1/16W
R414	ERJ2GEJ474	Carbon	470K ohms 1/16W
R415	ERJ2GEJ103X	Carbon	10K ohms 1/16W
R416	ERJ2GEJ512	Carbon	5.1K ohms 1/16W
R417	ERJ2GEJ103X	Carbon	10K ohms 1/16W
R418	ERJ2GE0R00X	Carbon	0 ohm 1/16W
R419	ERJ2GEJ332X	Carbon	3.3K ohms 1/16W
R421	ERJ2GEJ123	Carbon	12K ohms 1/16W
R422	ERJ2GEJ103X	Carbon	10K ohms 1/16W
R423	ERJ2GE0R00X	Carbon	0 ohm 1/16W
R424	ERJ2GEJ391X	Carbon	390 ohms 1/16W
R425	ERJ2GEJ102X	Carbon	1K ohms 1/16W
R426,427	ERJ2GEJ222	Carbon	2.2K ohms 1/16W
R428	ERJ2GEJ162	Carbon	1.6K ohms 1/16W
R430	ERJ2GEJ303	Carbon	30K ohms 1/16W
R431	ERJ2GEJ222	Carbon	2.2K ohms 1/16W
R432	ERJ2GEJ105X	Carbon	1M ohms 1/16W
R433	ERJ2GEJ154	Carbon	150K ohms 1/16W
R434	ERJ2GEJ104X	Carbon	100K ohms 1/16W
R435	ERJ2GEJ912	Carbon	9.1K ohms 1/16W
R436	ERJ2GEJ332X	Carbon	3.3K ohms 1/16W
R437	ERJ2GEJ432X	Carbon	4.3K ohms 1/16W
R438	ERJ2GEJ103X	Carbon	10K ohms 1/16W
R439	ERJ2GEJ432X	Carbon	4.3K ohms 1/16W
R440	ERJ2GEJ362	Carbon	3.6K ohms 1/16W
R441	ERJ2GEJ153X	Carbon	15K ohms 1/16W
R442	ERJ2GEJ513X	Carbon	51K ohms 1/16W
R443	ERJ2GEJ154	Carbon	150K ohms 1/16W
R444	ERJ2GEJ104X	Carbon	100K ohms 1/16W
R445	ERJ2GEJ332X	Carbon	3.3K ohms 1/16W
R447	ERJ2GE0R00X	Carbon	0 ohm 1/16W
R449,450	ERJ2GEJ103X	Carbon	10K ohms 1/16W
R451	ERJ2GE0R00X	Carbon	0 ohm 1/16W
R452	ERJ2GEJ113X	Carbon	11K ohms 1/16W
R453	ERJ2GEJ103X	Carbon	10K ohms 1/16W
R455	ERJ2GE0R00X	Carbon	0 ohm 1/16W
R456	ERJ2GEJ103X	Carbon	10K ohms 1/16W

REF. NO.	PART NO.	DESCRIPTION		REF. NO.	PART NO.	DESCRIPTION	
R457	ERJ2GEJ221	Carbon	220 ohms 1/16W	R542	ERJ2GEJ102X	Carbon	1K ohms 1/16W
R458,459	ERJ2GE0R00X	Carbon	0 ohm 1/16W	R543	ERJ2GE0R00X	Carbon	0 ohm 1/16W
R463	ERJ2GE0R00X	Carbon	0 ohm 1/16W	R544	ERJ2GEJ124X	Carbon	120K ohms 1/16W
R464	ERJ2GEJ105X	Carbon	1M ohms 1/16W	R545	ERJ2GE0R00X	Carbon	0 ohm 1/16W
R468	ERJ2GEJ101X	Carbon	100 ohms 1/16W	R546	ERJ2GE0R00X	Carbon	0 ohm 1/16W
R469	ERJ2GEJ102X	Carbon	1K ohms 1/16W	R548	ERJ2GEJ241	Carbon	240 ohms 1/16W
R470,471	ERJ2GEJ473X	Carbon	47K ohms 1/16W	R549	ERJ2GE0R00X	Carbon	0 ohm 1/16W
R472	ERJ2GEJ104X	Carbon	100K ohms 1/16W	R550(L416)	J0JCC0000114	Coil	
R473	ERJ3GEY0R00V	Carbon	0 ohm 1/16W	R551	ERJ2GEJ103X	Carbon	10K ohms 1/16W
R474	ERJ2GEJ752	Carbon	7.5K ohms 1/16W	R552	ERJ2GEJ201X	Carbon	200 ohms 1/16W
R475,476	ERJ2GEJ242	Carbon	2.4K ohms 1/16W	R553	ERJ2GEJ105X	Carbon	1M ohms 1/16W
R477	ERJ2GEJ752	Carbon	7.5K ohms 1/16W	R554	ERJ2GEJ103X	Carbon	10K ohms 1/16W
R478(L411)	J0JCC0000114	Coil		R555	ERJ2GEJ304X	Carbon	300K ohms 1/16W
R479(L412)	J0JCC0000026	Coil		R556	ERJ2GEJ101X	Carbon	100 ohms 1/16W
R480(L413)	J0JCC0000026	Coil		R557	ERJ2GEJ303	Carbon	30K ohms 1/16W
R481(L414)	J0JCC000026	Coil		R560	ERJ2GE0R00X	Carbon	0 ohm 1/16W
R482,483	ERJ2GE0R00X	Carbon	0 ohm 1/16W	R561	ERJ2GEJ103X	Carbon	10K ohms 1/16W
R484(L415)	J0JCC0000114	Coil		R563	ERJ2GEJ751	Carbon	750 ohms 1/16W
R485	ERJ2GE0R00X	Carbon	0 ohm 1/16W	R564	ERJ2GEJ152	Carbon	1.5K ohms 1/16W
R489	ERJ2GEJ152X	Carbon	1.5K ohms 1/16W	R565	ERJ2GE0R00X	Carbon	0 ohm 1/16W
R490,491	ERJ2GE0R00X	Carbon	0 ohm 1/16W	R566	ERJ2GEJ102X	Carbon	1K ohms 1/16W
R493	ERJ2GEJ102X	Carbon	1K ohms 1/16W	R567	ERJ2GEJ751	Carbon	750 ohms 1/16W
R498	ERJ2GE0R00X	Carbon	0 ohm 1/16W	R570	ERJ2GEJ103X	Carbon	10K ohms 1/16W
R501	ERJ2GEJ183	Carbon	18K ohms 1/16W	R572	ERJ2GEJ152	Carbon	1.5K ohms 1/16W
R502	ERJ2GEJ512	Carbon	5.1K ohms 1/16W	R573,574	ERJ14YJ750H	Carbon	75 ohms 1/4W
R503	ERJ2GEJ101X	Carbon	100 ohms 1/16W	R576	L311F202J402	Thermister	
R504	ERJ2GEJ201X	Carbon	200 ohms 1/16W	R577	ERJ6GEY0R00V	Carbon	0 ohm 1/10W
R505	ERJ2GEJ153X	Carbon	15K ohms 1/16W	R578	ERJ6GEYJ561V	Carbon	560 ohms 1/10W
R507	ERJ2GE0R00X	Carbon	0 ohm 1/16W	R579	YF2116511JT	Carbon	510 ohms
R508	ERJ2GEJ102X	Carbon	1K ohms 1/16W	R581	YWR0510P103D	Metal	10K ohms
R509	ERJ2GEJ473X	Carbon	47K ohms 1/16W	R582	YWR0510P202D	Metal	2K ohms
R510	ERJ2GEJ473X	Carbon	47K ohms 1/16W	R583	YWR0510P821D	Metal	820 ohms
R512	ERJ2GE0R00X	Carbon	0 ohm 1/16W	R584	YWR0510P102D	Metal	1K ohms
R513	ERJ2GEJ101X	Carbon	100 ohms 1/16W	R585	ERJ2GE0R00X	Carbon	0 ohm 1/16W
R514	ERJ2GEJ752	Carbon	7.5K ohms 1/16W	R586	-ERJ3GEY0R00V	Carbon	0 ohm 1/16W
R515	ERJ2GEJ102X	Carbon	1K ohms 1/16W	R590	ERJ2GE0R00X	Carbon	0 ohm 1/16W
R516	ERJ2GE0R00X	Carbon	0 ohm 1/16W	R594	ERJ2GE0R00X	Carbon	0 ohm 1/16W
R518	ERJ2GEJ102X	Carbon	1K ohms 1/16W	R1000	ERJ2GEJ104X	Carbon	100K ohms 1/16W
R519	ERJ2GEJ105X	Carbon	1M ohms 1/16W	R1001,1002	ERJ2GEJ304X	Carbon	300K ohms 1/16W
R521	ERJ2GE0R00X	Carbon	0 ohm 1/16W	R1003	ERJ2GEJ104X	Carbon	100K ohms 1/16W
R522	ERJ2GEJ302X	Carbon	3K ohms 1/16W	R1004	ERJ2GE0R00X	Carbon	0 ohm 1/16W
R524	ERJ2GEJ104X	Carbon	100K ohms 1/16W	R1006	ERJ2GEJ103X	Carbon	10K ohms 1/16W
R525	ERJ2GEJ684X	Carbon	680K ohms 1/16W	R1007	ERJ2GE0R00X	Carbon	0 ohm 1/16W
R526	ERJ2GE0R00X	Carbon	0 ohm 1/16W	R1008	ERJ2GEJ821X	Carbon	820 ohms 1/16W
R527	ERJ2GEJ394X	Carbon	390K ohms 1/16W	R1009	ERJ2GEJ271X	Carbon	270 ohms 1/16W
R528	ERJ2GEJ242	Carbon	2.4K ohms 1/16W	R1010	ERJ2GE0R00X	Carbon	0 ohm 1/16W
R529	ERJ2GE0R00X	Carbon	0 ohm 1/16W	R1012	ERJ2GEJ104X	Carbon	100K ohms 1/16W
R532	ERJ2GEJ242	Carbon	2.4K ohms 1/16W	R1013	ERJ2GEJ304X	Carbon	300K ohms 1/16W
R533	ERJ2GE0R00X	Carbon	0 ohm 1/16W	R1014	ERJ2GE0R00X	Carbon	0 ohm 1/16W
R534,536	ERJ2GEJ752	Carbon	7.5K ohms 1/16W	R1017	ERJ2GEJ391X	Carbon	390 ohms 1/16W
R537	ERJ2GEJ201X	Carbon	200 ohms 1/16W	R1022	ERJ3GEY0R00V	Carbon	0 ohm 1/16W
R538	ERJ2GEJ0R00X	Carbon	0 ohm 1/16W	R1023	ERJ2GE0R00X	Carbon	0 ohm 1/16W
R539	ERJ2GEJ105X	Carbon	1M ohms 1/16W	C401	YW36B103K1T	Ceramic	0.01 µF
R540	ERJ2GEJ201X	Carbon	200 ohms 1/16W	C403	YW36CH101J5T	Ceramic	100 pF
R541	ERJ2GEJ391X	Carbon	390 ohms 1/16W	C404	F1H1C104A001	Ceramic	0.1 µF

REF. NO.	PART NO.	DESCRIPTION	
C405	F1G1C6830003	Ceramic	0.068µF
C406	MCUV1C104ZFQ	Ceramic	0.1 µF
C407	F1H1C104A001	Ceramic	0.1 µF
C408	YW36B102K5T	Ceramic	1000 pF
C409	MCUV1C104ZFQ	Ceramic	0.1 µF
C410	F1G1H510A408	Ceramic	51 pF
C411	YW36B103K1T	Ceramic	0.01 µF
C412	F1H1H101A004	Ceramic	100 pF
C413	F1H1E224A004	Ceramic	0.22µF
C414	MCUV1C104ZFQ	Ceramic	0.1 µF
C415	F1H1C104A001	Ceramic	0.1 µF
C416,417	MCUV1C104ZFQ	Ceramic	0.1 µF
C418	YW36B222K5T	Ceramic	2200 pF
C419	MCUV1C473ZFQ	Ceramic	0.047 µF
C420	YW36B471K5T	Ceramic	470 pF
C421,423	MCUV1C104ZFQ	Ceramic	0.1 µF
C424,425	MCUV1C104ZFQ	Ceramic	0.1 µF
C426	F1H1A105A004	Ceramic	1 µF
C427-429	MCUV1C104ZFQ	Ceramic	0.1 µF
C430,431	F1G1H3300001	Ceramic	33 pF
C432,433	YW36B103K1T	Ceramic	0.01 µF
C434-436	F1H1A105A004	Ceramic	1 µF
C437 440	YW36B103K1T	Ceramic	0.01 µF
C441,442	F1H0J105A001	Ceramic	1 µF
C443	MCUV1C104ZFQ	Ceramic	0.1 µF
C444	YW36B103K1T	Ceramic	0.01 µF
C445	F1H1H103A013	Ceramic	0.01 µF
C446,447	MCUV1C104ZFQ	Ceramic	0.1 µF
C448	F1H0J105A001	Ceramic	1 µF
C449	YW36B103K1T	Ceramic	0.01 µF
C450	MCUV1C104ZFQ	Ceramic	0.1 µF
C451	YW36B103K1T	Ceramic	0.01 µF
C453	MCUV1C104ZFQ	Ceramic	0.1 µF
C454	F1H1A105A004	Ceramic	1 µF
C455	MCUV1C104ZFQ	Ceramic	0.1 µF
C456	YW36B103K1T	Ceramic	0.01 µF
C457,458	MCUV1C104ZFQ	Ceramic	0.1 µF
C459,461	YW36B102K5T	Ceramic	1000 pF
C462	YW36B103K1T	Ceramic	0.01 µF
C469	F1K1E105A017	Ceramic	1 µF
C470	MCUV1A105KBN	Ceramic	1 µF
C471	YWE212F105ZT	Ceramic	1 µF
C472	F1H1A105A004	Ceramic	1 µF
C473	YWE212F105ZT	Ceramic	1 µF
C474,475	F1H1A105A004	Ceramic	1 µF
C476	YW400475FZT	Ceramic	4.7 µF
C477	F3H0J1560001	Tantalum	15 µF 6.3V
C478	YW400475FZT	Ceramic	4.7 µF
C479	YWE212F105ZT	Ceramic	1 µF
C480	F3F1A1060001	Tantalum	10 µF 10V
C481	F3H0J1560001	Tantalum	15 µF 6.3V
C482	F3F1A1060001	Tantalum	10 µF 10V
C483	F3F1A1060001	Tantalum	10 µF 10V
C484	YW400225FZT	Ceramic	2.2 µF
C485	MCUV1C104ZFQ	Ceramic	0.1 µF

REF. NO.	PART NO.	DESCRIPTION	
C486	MCUV1C104ZFQ	Ceramic	0.1 µF
C487	F1H1A105A004	Ceramic	1 µF
C488	EEVHB0J331P	Electrolytic	330 µF 6.3V
C489	EEVHB0J330R	Electrolytic	33 µF 6.3V
C490	F3G1C156A002	Tantalum	15 µF 16V
C491	ECST1CY105R	Tantalum	1 µF 16V
C492,493	YWSK41C475MA	Tantalum	4.7 µF 16V
C494	F3F1A1060001	Tantalum	10 µF 10V
C495	F3H1E4750002	Tantalum	4.7 µF 25V
C496	F1L1A1060001	Ceramic	10 µF
C497	ECST1EC106R	Tantalum	10 µF 25V
C498	F3F1A1060001	Tantalum	10 µF 10V
C499,500	ECST0JY335R	Tantalum	3.3 µF 6.3V
C501	YW32Y106F16T	Ceramic	10 µF
C502,503	YW36B103K1T	Ceramic	0.01 µF
C800	YW36B103K1T	Ceramic	0.01 µF
C801	F1H0J105A001	Ceramic	1 µF
C802	F3F1A1060001	Tantalum	10 µF 10V
C805	YW36CH220J5T	Ceramic	22 pF
C808	MCUV1C104ZFQ	Ceramic	0.1 µF
C812	MCUV1C104ZFQ	Ceramic	0.1 µF
C814	MCUV1C104ZFQ	Ceramic	0.1 µF
C817(R1024)	ERJ2GE0R00X	Carbon	0 ohm
C820	F1G1H561A401	Ceramic	560 pF
L401,402	ELJFC8R2MF	Coil	8.2 µH
L403,404	ELJFC2R2JF	Coil	2.2 µH
L405	ELJPC330KF	Coil	33 µH
L406-408	ELJFC2R2JF	Coil	2.2 µH
L409	ELJPC100KF	Coil	10 µH
L451	YW639AN0518	Coil	
L504	J0JCC0000036	Coil	
X401	H2D160500003	Crystal Oscillator	
X404	H1C1775B0001	Crystal Oscillator	
CF401,402	YWNL4532S4R4	LC Filter	
CN401	K1KA40A00102	40pin-Connector	
CN402	YWTKCF20XG2	20pin-Connector	
CN404	YWTKCF08XG2	8pin-Connector	
TP401-405	YWRCT2125TPV	Test Pin	

REF. NO.	PART NO.	DESCRIPTION
I/F BOARD		
PCB3 (RTL)	VCP46EKY3A	Printed Circuit Board Ass'y
IC4	C0CBAAC00019	IC
IC5	C0CBAAC00021	IC
IC14	C0CAABE00001	IC
R1	ERJ14Y0R00H	Carbon 0 ohm 1/4W
R3-7	ERJ3GEYJ204V	Carbon 200K ohms 1/16W
R10	ERJ3GEYJ102V	Carbon 1K ohms 1/16W
R16	ERJ3GEYJ750V	Carbon 75 ohms 1/16W
R59,60	D0YBR0000007	Carbon 0 ohm 1/16W
R86	D0YBR0000007	Carbon 0 ohm 1/16W
R98	ERJ12Y0R00H	Carbon 0 ohm 1/2W
C24	MCUV1E104ZFV	Ceramic 0.1 µF
C25,26	F1H1A105A002	Ceramic 1 µF
C27	MCUV1E104ZFV	Ceramic 0.1 µF
C28,29	F1H1A105A002	Ceramic 1 µF
C59	ECST1AY106R	Tantalum 10 µF 10V
C60	ECST1CY475R	Tantalum 4.7 µF 16V
C61	F1H1H100A017	Ceramic 10 pF
C62	F1H1H100A017	Ceramic 10 pF
C63	F1H1H100A017	Ceramic 10 pF
L5	ELJFCR68MF	Coil 0.68 µH
L6-8	ELJFC8R2MF	Coil 8.2 µH
SW1-5	YWSKQDPB	Push Switch
SW6	K0D222A00020	Slide Switch
CN1	YWTKCF20PM2	20-pin Connector
CN2,4	YWP2367	BNC Connector
CN6	YWM1963	4-pin Connector
M36	V2KA1317A4	Chassis (BNC Connector)
M37	YWV2SA4446A4	Mounting Angle (ALC Connector)

REF. NO.	PART NO.	DESCRIPTION
ACCESSORY PARTS/PACKAGING PARTS		
CN101	YWM1943A	ALC Lens Connector
E101	YWACP45BA	AC Power Cord for WV-CP460/G
M41 ⚠	V8QA5379AN	Operating Instructions (German)
⚠	V8QA5380AN	Operating Instructions (Spanish)
⚠	V8QA5447AN	Operating Instructions (English)
⚠	V8QA5448AN	Operating Instructions (French)
⚠	V8QA5449AN	Operating Instructions (Chinese)
M44	YWT050803	Polyethylene Bag
M45	PE20X35C05B	Polyethylene Bag
M46	V9CA4152AN	Packaging Ass'y for WV-CP460/G
	V9CA4155AN	Packaging Ass'y for WV-CP464E